Scientific American

AN ILLUSTRATED

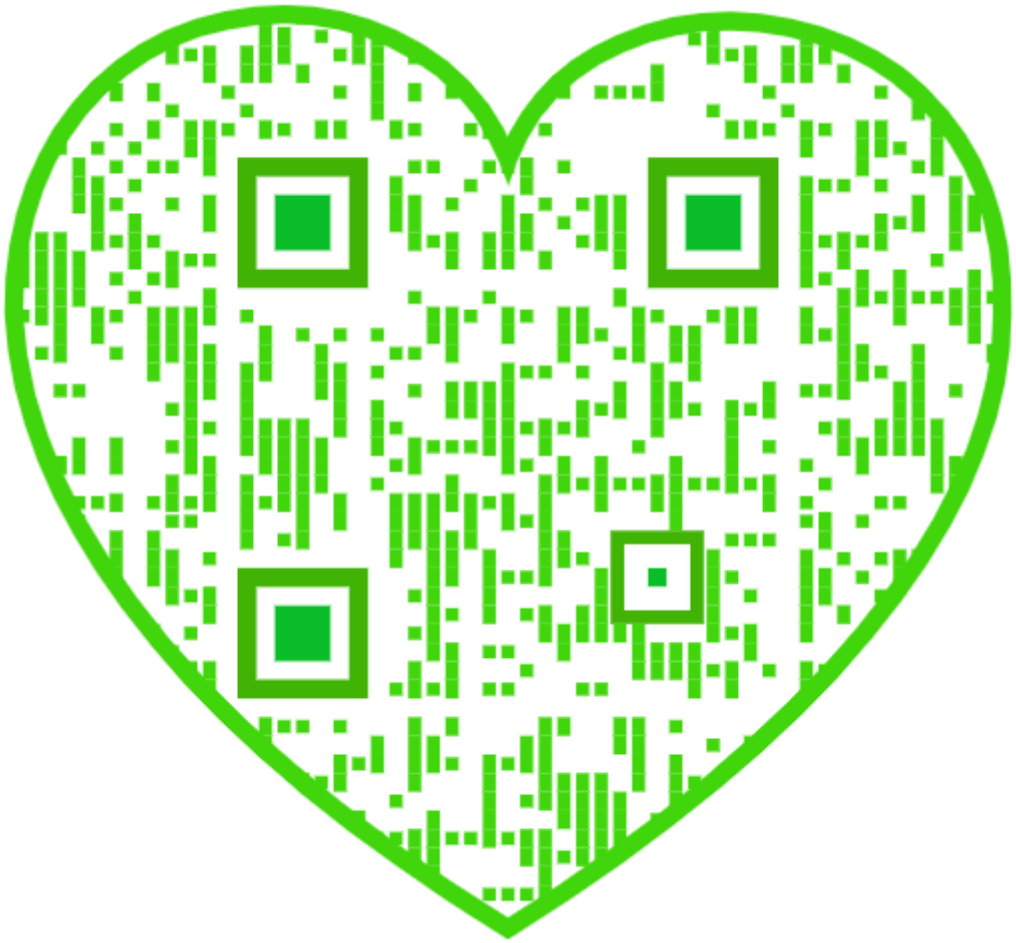
JOURNAL OF ART, SCIENCE & MECHANICS

Vol. XVIII.

NEW-YORK

PUBLISHED BY MUNN & CO.

© 1868 SCIENTIFIC AMERICAN, INC.



SCIENTIFIC AMERICAN

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES.

Vol. XVIII.--No. 1. [NEW SERIES.] NEW YORK, JANUARY 4, 1868. $3 per Annum. [IN ADVANCE.]

Improvement in Setting Blocks for Saw Mills.

Fig. 1 of the accompanying engravings presents a perspective view of an improved device for setting logs to be sawed to any required thickness. The setting frame, it will be seen, is not in proportion to the carriage and frame, as the representation was taken from a model; practical sawyers will, however, readily understand the operation of the device. Fig. 2 is a top plan of the setting device.

The machine is driven by a belt on the pulley, A, on the same shaft of which is another pulley, driving by the belt, B, a loose pulley, C, the hub of which is a clutch engaging with a similar clutch forming part of the pinion, D. A lever, E, serves to ship the gear and clutch, D, from contact with the gear, F, and pulley, C, when the machine is to be operated by hand. A belt from the pulley, G, the shaft of which carries the gear, F, drives the pulley, H, Fig. 1, and this, by means of the gear, I, same figure, turns the screws that move the head blocks, J, the two screws being connected by pulleys and belt as seen in both figures. The connection between the driving power and the movable heads is thus sufficiently explained; the automatic setting of the log is assured by the device to be described.

On the shaft that carries the pulley, G, is an index plate, K, perforated with holes, and having a toothed or serrated edge. In the holes fits a pin passing through a slot in the spring, L. A pawl lever, M, held to the periphery of the index wheel, K, by a spring, engages with the ratchet teeth on the disk. Attached to the disk or index is a cam, N, seen in Fig. 2, that operates an arm, O, secured to the shaft on which are the wheels, D and C, and moves the clutch on the same shaft to disconnect it with the pulley, C, which is held in place by the guide, P, Fig. 2.

The holes in the disk are numbered, and spaced to correspond with the pitch—four to the inch—of the screws which move the head-blocks, J. Of course the gears, D and F, have teeth, in number conforming to regular proportions, those in the first being just half as many as those in the latter. Consequently, for every turn of the screws, the wheel, D, makes two revolutions, while the gear, F, makes one. By these means unfailing accuracy is secured.

When any given thickness of lumber is required, the pin in the spring, L, is set in that hole in the index numbered to correspond to half the number of revolutions of the pinion, D. If, for example, ten revolutions are required to move the log the distance desired, the pin is set in the hole numbered five. The two halves of the clutch are then engaged, and the machine put in motion, when a little dog on the shaft, carrying the arm, O, successively, moves one tooth after another with each revolution of the shaft, and the movement being completed, the cam, N, engages with the arm, O, and instantly disconnects the clutch, and stops the transverse motion of the log. Then, by drawing back the pawl lever, M, the index is thrown back to its starting point by means of a coiled spring, and engaging bar on its face—seen in Fig. 1. When only half a turn is desired, the pin is set in one of the inner circle of holes in the index

The inventor claims, that with this machine the work can be done quicker and better than by hand, that the device sets the log always accurately, and its use dispenses with the labor of one man or boy. It can be changed instantly, while the machine is running, from one grade or thickness of lumber to another. Lumber sawed by a machine provided with this attachment is much more even in thickness than that which is sawed on the ordinary mill where the stock is fed to the saw by hand. The patentee will sell the right for the Eastern States. The letters patent, dated Sept. 17, 1807, were procured through the Scientific American Patent Agency by Titus Whitmore, Dubuque, Iowa, whom address for further information.

Fig. 1.

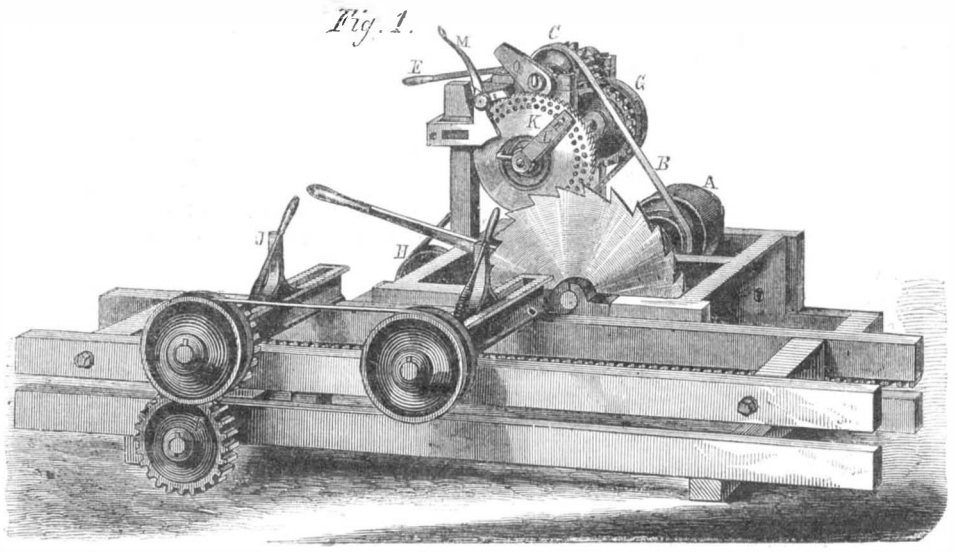
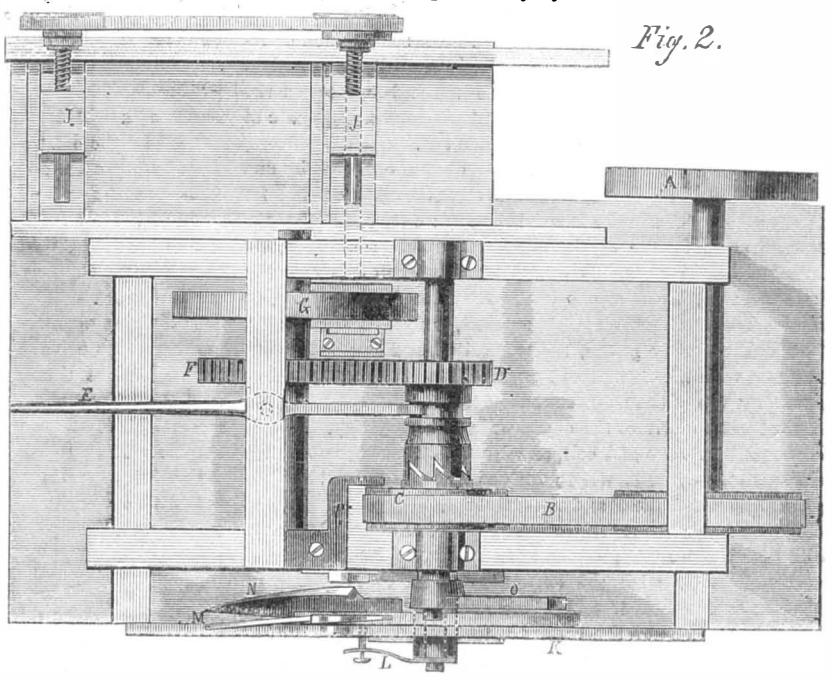


Fig. 2.



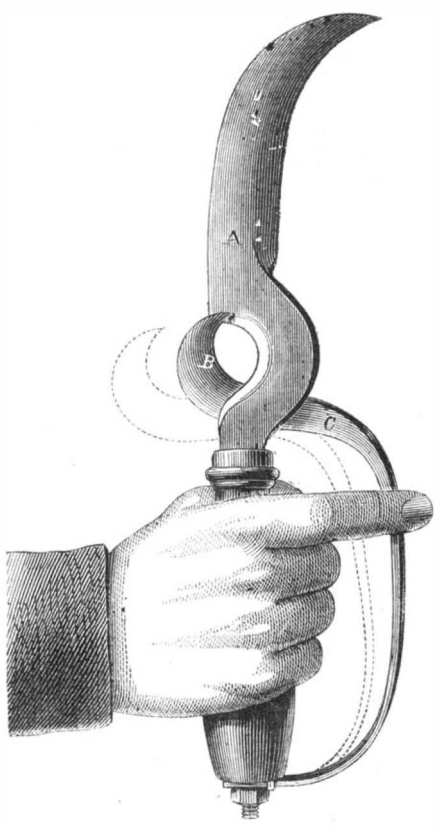
WHITMORE'S PATENT HEAD-BLOCKS.

Important Patent Suit.

A patent case of great importance to stave manufacturers has recently been decided in the United States Circuit Court for the western district of Michigan. This was a suit in chancery between parties residing at Kalamazoo, for the infringement of a patent for a stave machine, granted to Wm. Sisson, of Fulton, N. Y., on the 24th of Sept., 1861, under which the complainants claimed. The defense denied that the improvement was invented by Wm. Sisson, and also alleged that if he was the inventor he had abandoned the invention to the public before making application for his patent. The case came on for a final hearing at the October term, and the Court fully sustained the patent, and issued an injunction to restrain the defendants from the further use of the machine.

BARLEY'S CANE STRIPPING AND PRUNING KNIFE COMBINED.

The improvement illustrated in the engraving is intended for topping, stripping, and cutting off the cane of sorghum or the ordinary sugar cane to prepare it for the grinding or squeezing process. The blade used for topping the cane is



curved as at A, similar to the blade of a pruning knife. Its back at the rear end next the handle is formed into a curved edged jaw, in connection with which the spring jaw, B, completes a device for stripping the cane of its leaves.

In operation, after topping the cane with the blade, A, a pressure of the index finger on the spring, C, opens the jaw, B, to receive the cane, when the tension of the spring, C, will grasp the stalk, and a downward motion of the hand holding the stripping knife cleans off the leaf blades, and a drawing motion toward the operator will cut the cane off at any required point. By removing the spring and blade, B and, C the implement becomes an efficient pruning knife. The dotted lines show the position of the spring blade when brought up to receive the cane. This blade with its spring is attached by a nut and screw or some other suitable device to the end of the shank of the knife proper, and is constructed so as to pass freely by the main blade and to have its point engage with the opposite side of the blade, which gives it a firm hold in the act of stripping.

This improvement was patented through the Scientific American Patent Agency, Sept, 24th, 1867, by J. H. Barley, who will reply to all communications addressed to him at Sedalia, Mo. Territorial and manufacturing rights for sale.

PASSENGER TRAVEL ON BRITISH RAILWAYS.

From the columns of an exchange we transfer the following interesting correspondence respecting English railways as compared with those of our own country. The rolling stock on the English roads when contrasted with that found on American railways at first strikes the stranger unfavorably. The locomotive without polish, painted with a dull, gray, stone paint, illustrates the contempt for appearances as to attractiveness in color or model characteristic of English ideas.

"Cars with like dark, dingy color, improved by coal smoke, and ugly baggage railings on top, with some tarpaulin coverings thrown over the unsightly piles of old trunks and furniture, make up even the first-class trains. Coal is burned in these locomotives, in furnaces at the rear within the exterior circle of the tubular boiler, the heat being conducted through the boiler by a multitude of small tubes terminating in front, in a common air or smoke chamber, from which a funnel or flue, about twelve inches in diameter, with a top shaped like an inverted bell, rises perpendicular about three feet above the top of the boiler. Of course they need no spark arresters, and seem to require less draft in running their fires than ordinary wood engines.

"These engines are scarcely two-thirds as high as locomotives on American roads. It seems to be a desideratum to place the weight of the machine and the water of its boiler, as near the track as can be done, and still leave the necessary space for its wheels and machinery. The cars are about twenty-five feet in length, and run on double trucks like ours, but on two pairs of wheels to each car, with a shaft passing through a frame on which the car body rests, with intervening springs. The wheels are not as large or so heavy as those used on American roads, bringing the body of the cars some eight to ten inches nearer the track.

"Each car is divided into three compartments or 'carriages,' each carriage with two seats across the car, facing each other—the entrance being on the side, between the seats. Each seat will accommodate three first-class passengers, or four second or third-class. The interiors of the first-class carriages are luxuriously upholstered, the seats being finished as easy chairs with side arms, so that the seats occupy the width of the car, and eighteen sittings will fill an entire car. The second-class cars or carriages, for first, second and third-class carriages or compartments, are sometimes found in the same car, and are furnished with cushioned seats and cushions for the back, but have no divisions into separate seats, so that eight passengers can sit quite comfortably in each carriage, or 24 in each car when full. Third-class cars have either plain board seats, or in some cars, none at all.

© 1868 SCIENTIFIC AMERICAN, INC.

"The gage of English railways is four feet, eight and one half inches, and while cars on American roads have a projection of over a foot on each side beyond the track, the English cars project only from six to eight inches, not measuring the plank step on each side, extending along the car outside, on which the guard or conductor passes the entire length of the train when necessary, while it is in motion.

"The English cars are much lighter in structure than ours, and by their momentum when in motion have less force against the control of the train by the engineer. It will be seen that these cars have no front or rear platform, but are kept apart from each other by spiral-spring railroad buffers. These consist of a turned iron bolt, about 2½ inches in diameter, around which is a coiled steel spring. The bolts and the coiled spring around them are inserted in a socket a foot to a foot and a half at each end of the lower side timbers of the cars, making four buffers to each car, projecting some six or eight inches beyond their sockets in the end of the timbers, and presenting a disk in the form of a bolt head toward the next car in the train some eight inches in diameter, with a wood face sunk in a circular case of iron. As the train slackens speed these disks come in contact and force back the bolts bearing them into their sockets, compressing the spiral springs surrounding the bolts within their sockets and so relieving, to a considerable extent, the force of the concussion. The lightness of the cars produces much less force in the concussion, even when the train slackens from a high rate of speed, than do the heavy cars on our roads.

"The trains have a single screw brake, operated by one brakeman inside a compartment of one of the cars fitted for the purpose. The brake is controlled by an effective power of a screw and leverage combination that answers quickly and effectively the movements of the machine. In this way two brakeman to a train, or one if the route to be run is short, do the work of from three to half a dozen, on our express trains. The conductor or guard, as he is called, has his seat in the rear car, with a compartment sometimes elevated a foot or so above the top of the train, so that he can see the entire length of the train and direct the engineer in any exigency. This is done not by a rope and bell, as with us, but the guard has a shrill metal whistle, whose various sounds are well understood between himself and the engineer.

"Most American travelers have a dread of danger by fire or otherwise, while traveling on such trains, without means of communicating with the engineer or guard. They have a kind of notion that if a kerosene lamp, which is usually let down in the top of the carriage, to light them by night or through tunnels, should explode, they would be considerably suffocated or scorched before communication could be had to stop the trains and facilitate their escape. On the trains from London to distant principal towns, a second guard, who has charge of the baggage, usually goes through. His office answers to that of baggage master with us; though he is of the same grade and authority in running trains as the captain of the train, in case it is put into his hands or the captain should be sick. Hence, the long-travel English trains have two competent guards or conductors, two brakemen, a fireman and engineer, with casual supernumeraries as porters and the like passing over the road. Next to the police, I found the guards on the railways the most obliging men in England. Their responsibility ends with the safe conducting of their train to its destination. They collect no fare by the way, and run their trains by the instructions of the head railway officer of the company in London.

"At the head office, and at the depots along the route, are a class of railway officials called 'booking agents' and porters. Half of these officials either fill sinecures or are employed in red tape details which add nothing to the income of the company. Two ticket agents at depots within our large cities, and the station agent at each intermediate station, are found amply sufficient to conduct the sale of tickets on our most traveled roads. But in Great Britain, first-class, second-class, and third-class tickets must each have a separate agent for their sale at most of the stations, and where night as well as day trains are run, a double number of these offieials are usually employed. There are also nearly as many porters as booking agents, thus illustrating the proverb, that 'where the carcass is there will the buzzards be gathered together.'

"The 'luggage vans,' as they are called, are not provided in sufficient size and numbers to accommodate travel on the great thoroughfares, and this custom of loading the tops of the passenger cars has sprung up to meet the exigency. Since I am on the subject of baggage, I may as well note here that all responsibility as to the safe transportation and delivery of baggage by British railroads, is avoided as far as possible. Their system, or rather lack of system, is most villainous. The system of checking baggage, as prevailing in this country and on the continent, is entirely excluded, and the responsibilities of the company are limited by acts of Parliament to the narrowest limits. You may see your baggage put into the 'van,' but what railroad employé knows that it is yours? If a confidence man should turn up at your destination, he might carry off your baggage under claim of ownership, and you have no check by which you can identify your luggage or repel the theft. The English custom in this department seems to make the baggage say to every wandering loafer, 'come and steal me.'

"The English railways are constructed at a greater expense per mile than those in America. The road beds are better prepared for their superstructures, rails are laid with more uniform and even supports, and the joints of the rails, while sufficient allowance is made for contraction and expansion by heat and cold, are so fished as to present a uniform surface to the wheels of the cars, so that little motion or jolting of the cars is felt by the passengers, and traveling is far less fatiguing than on our roads. On most of the lines the expense of construction is greatly increased by tunnelling and excavations to avoid curves or ascents and descents in the structure. Of course, the tunnels have to be protected by heavy masonry, and the excavations are sloped down from the surface of the ground at an angle of some 45 degrees, the slope being neatly sodded or cultivated with grass, flowers or grain, by the station men along the road. Then the stations are stone structures, erected at great expense; in many instances far beyond the necessities of the business of the roads. Every crossing of the track by highways is either tunneled under the road or bridged over it, as we stated, and at all stations are foot bridges over the road, which passengers and others who have occasion to cross the track must take, as it is a misdemeanor to cross the track otherwise, except by the employés of the road.

"The speed on English railroads varies from twenty to fifty miles an hour, according to the condition of different roads and the exigencies affecting the business interests. On the whole, their speed is about one third greater than that of trains on our own roads.

"I have stated that the rolling stock is much lighter than ours; and ordinary freight cars are limited to five tuns burthen by law, or by a legal inspection required by statute. They are mostly flats, relying upon tarpaulin coverings to protect the goods transported from wet weather.

"The fares on these railways are nearly double the fares on our own. The cost of transportation is considerably increased by the English system of caste or classes of passengers. They must go prepared to carry first, second and third-class passengers, while however over-crowded the cars of some of these classes may be, no one must set foot in the car of another class, though half a dozen cars of such class may be running vacant over the road. Hence the transportation of vacant cars is a wasting expense to almost every train run. This division of classes in passengers renders a much larger number of trains each day necessary to do the business of the road. No less than five trains stopped at Stafford on their way to Rugby and London. All were to pass over the same road within an hour of time from the earliest to the latest of the five. If there had been no classes with the passengers, three of these trains would have accommodated all the passengers, and the expense of running two of them would have been saved."

Omnibus Subways.

Mr. Peter Barlow has published the prospectus of a scheme which, if we could take his word for it, would revolutionize railway engineering—dispensing with steam, and, indeed, nearly all other power, and reducing wear and tear to almost next to nothing. He proposes to drive a system of tubular subways under London—first of all under the Thames, near the Tower, and to work carriages through them, each weighing two tuns, loaded, and containing twelve passengers, the motive power to be that of *one man!* Mr. Barlow estimates the friction of his omnibus, running on a very accurately laid railway, as four pound only per tun, and the resistance of the air at two pound more, or six pound per tun in all, or twelve pound only for the loaded carriage! He proposes to make the quarter-mile run of the Tower subway in 2½ minutes, or at the rate of six miles only an hour. With "two and half men," however, which means, we suppose, two men and a boy, the run can, he says, be made in one minute, or at the rate of fifteen miles an hour, which is more like what the public would require.

Of course, if safe railway carriages can be made to weigh no more than the weight of the passengers carried—the present ratio being as from three to five tuns of carriage to one tun of passengers, and if the resistance to motion may be diminished to but from four pounds to six pounds per tun, Mr. Barlow's scheme may answer; but so, of course, a reform could be made in all our ordinary railways, which would save something like eight millions yearly in their working expenses, equal to 2 per cent additional dividend upon the £400,000,000 invested in British railways.

Mr. Barlow proposes to drive his cast-iron tubes horizontally through the soil by means of powerful hydraulic pressure; and between stopping-places (for he dispenses with stations) he proposes to let the line descend for half way, and then rise again, so as to help the carriage off on starting, and help also to bring it up without brakes in stopping. The passengers are to be lowered to and lifted from the tubes by hydraulic lifts.

The plan reminds us somewhat of the proposition printed a few years ago by a shareholder in the Great Western Company, who insisted that the trains on the branches of the company's lines might be worked each by a horse, mounted on an endless railway in the guard's van, and who would thus work the train at ten miles an hour, while, "if whipped up," the poor brute would "easily" do twenty!—*Engineering.*

NEW LETTER ENVELOPE.—An English patent has been granted for an improved adhesive envelope named the Camden Envelope. The gum is placed upon the lower fold instead of the flap, so that the tongue comes in contact with clean paper when the flap is wetted to secure the envelope. The general form of the envelope is admirably adapted for the protection of the contents. Those who write many letters will appreciate an invention which does away with the disagreeable task of licking a gummed surface.

A FLOURISHING VINE.—In Santa Barbara, California, is a grape vine planted forty years ago, and which now measures, at four feet from the ground, three feet around it. At the hight of six feet it branches out, and the branches, which are supported by scaffoldings, spread over an area of from 1,000 to 1,200 feet. The annual crop from this vine averages four tuns, and has at some seasons exceeded 12,000 pounds.

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

For the Scientific American.

ON SNOW, RAIN, AND HAIL, IN THEIR RELATIONS TO THE ATMOSPHERE.

The condensed moisture of the air is never pure water (H O) alone, as it is generally supposed, it even presents in its composition the same if not a greater variety than the springs flowing from the interior of the earth. This is easily understood when we consider that the elastic fluid which envelops the earth in an aerial ocean is not simply a mixture of nitrogen and oxygen and a small amount of carbonic acid, but also contains though in small quantities, a great many other substances, which are readily absorbed by the descending precipitates, and as the atmosphere itself is modified in its condition according to adjacent circumstances, so also the condensed moisture, which we perceive in the form of snow, rain, or hail. Though the amount of foreign substances in the air may often almost be infinitesimal, they are not always to be considered as altogether insignificant.

Nitrogen and oxygen are not met with in the same proportions in the many forms which moisture assumes, there being about one-fifth less of the former, one-third more of the latter, with still a greater proportion of carbonic acid contained in them as contrasted with dry atmospheric air.

The combustion of fuel and the continual cremecaresis (slow decay) of organic matter occurring on the surface of the globe is the origin of the presence of ammonia in atmospheric moisture. It is met with in both the free and combined state, in the latter with nitric or carbonic acid. Nitric acid is known to be formed by electrical discharges, the nitrogen of the air combining directly with its oxygen. Nitrate of ammonia is therefore constantly to be met with in rain during and after thunder storms. Boussingault even claims to have found it always in the rain, though in very minute quantities. Its amount is, however, almost always not observable a very great time after the storm has ceased, but the converse has been found to be true of a fine shower.

In snow and hail more ammonia is present than in rain, probably owing to the greater cold in which they are formed, ammonia being more readily absorbed by cold than by heat. Rain falling after a dry season abounds with ammonia, often containing six milligrams to the liter (1 milligram=0·0154 grains; 1 liter=1·0567 wine measures), this not being the case with the rain of a rainy period. Nitric acid is, as we have mentioned already, found in combination with ammonia, but only in its free state, during heavy thunder storms, when the rain will sometimes redden blue litmus paper. The average quantity of nitric acid in rain water is stated to be one-millionth part of its entire bulk. Snow has been found to contain more nitric acid than rain, and hail more than rain.

Traces of sulphuric acid have been discovered in the rain of London and Manchester, and Dr. August Smith is accounting for its presence, which doubtless finds its explanation in the sulphurous vapors produced by the combustion of coal, with the rapid disintegration of buildings in those cities. Sulphuric acid has been detected in larger proportions in the rain of Manchester than in that of London; though London is the greatest city of the world, Manchester is the largest manufacturing town and the center of a manufacturing district comprehending many hundred square miles; hence we must not be surprised to find the products of combustion existing in a larger proportion in the latter than in the former city.

The atmospheric air is also most generally impregnated with the saline products arising from sea water. Near the coast salt is found to be present in rain water to the amount of seven parts to the million, but less then half that proportion some hundred miles in the interior. The French chemist, Barral, calculates that near Paris forty pounds of salt are yearly descending in the rain on one hectare of land (1 hectare =2·471 acres), and according to Chatin the rain water in Paris during the prevalence of westerly gales is even more impregnated with salt than is the water of the Seine. Snow and hail always contain less salt, as they are formed in more elevated regions.

Chatin also holds that iodine is present in all atmospheric precipitates, which assertion, however, is contradicted by most investigators, they attributing its supposed presence to the impure reagents employed in its detection.

Sulphuretic hydrogen has been observed in the atmospheric precipitates of some parts of the western coast of Africa, where the rivers which empty into the sea abound in decaying organic matter, and phosphoric acid has been detected by Wiegmann in noxious fogs and mists.

Organic substances of an unknown nature are often found in atmospheric precipitates, but Boussingault claims to have discovered marsh gas in the rain of miasmatic sections to the amount of 0·0017 per cent, and Ehrenberg describes the inky rain falling on the 14th of April, 1849, in Ireland over an area of 700 English square miles as putrescent vegetable organism, probably brought there by passing winds.

Non-volatile substances, as meteoric, volcanic, and ordinary dust have often been found in rain, snow, and hail, but they are not of general occurrence. "Photo-chemical analysis," that recent and wonderful discovery, will surely reveal to us many other natural wonders occurring in atmospheric air.

The Hoosac Tunnel Drills.

MESSRS. EDITORS:—I noticed in your paper a short time ago a short account of the Hoosac Tunnel and drills, and credited them to Mr. Burleigh, of Fitchburg. I would merely say that I am the original inventor of the Hoosac Tunnel

© 1868 SCIENTIFIC AMERICAN, INC.

Drill that they are now using. I obtained my patent in 1851 and showed a working machine to a number of the legislators at that time. They thought favorably of it, but were too skeptical. I was a number of years ahead of the times. If they had adopted it at that time they would have had a hole through the mountain and trains running a long time ago. I got my patent extended. and have since sold out to Mr. Burleigh, who had taken out a patent which he thought was an improvement. But the drills are made now substantially as I made mine over seventeen years ago. The main idea was using the direct action of the steam or air in a direct line with the drill, so that I could drill horizontally or at any angle up or down, as wanted. Mr. Burleigh, of Fitchburg, now holds the patent, and the machines are made by the Putnam Machine Company, of which he is one of the partners and superintendent, I believe. JAS. W. FOWLE.

Boston, Mass.

Replies to Questions on the Day Line.

MESSRS. EDITORS:—On page 387, Vol. XVII. of your valuable paper will be found several questions relative to the day line, which are asked by Mr. Lyman Thayer, of Burlington, Vt.; I suppose for the purpose of bringing out the thoughts of its readers on this interesting question. I think I can solve these questions to the satisfaction of all.

If a man start from New York on Monday noon, and goes west, keeping pace with the sun, he would pass from Monday to Tuesday, when he crossed the day line, which I have taken as the 180th meridian.

If the 180th meridian be taken as the day line, it is 12 minutes of 1 o'clock on Tuesday morning at Pekin, China, when it is noon at New York.

When it is Monday noon at New York, the same day (Monday) extends just 180° east of New York, or about to the 105th degree of east longitude, reckoning from Greenwich, at which point (105° E.) it is just midnight. And the same day of the week will extend west of New York to the 180th meridian, to the east of which line it is a small fraction after 5 o'clock on *Monday morning*, while on the west side it is 5 o'clock *Tuesday morning;* thus making about 24 hours difference in time between the two sides of the day line.

To the question whether there is a point of time in the revolution of the globe when it is Monday, for example. on the entire globe, I would reply that there is such a point of time, but so inconceivably short that it is totally inappreciable to our senses, but for all practical purposes such a point of time may be considered to exist, and just 12 hours from this time it is Monday on one half of the globe while it is Tuesday on the other.

In regard to the day line itself, I cannot think such a line does really exist; but for this very reason it becomes more important to define such a line by legislation; and the one which answers the purpose best, I think, is the 180th meridian from Greenwich. If reference be made to a map of the world it will be seen that the only land through which this meridian passes, is the extreme eastern part of Siberia, where it would not much interfere with the day question. Another reason is that if this meridian (180th) be taken to represent 12 o'clock midnight, it brings the meridian of Greenwich at 12 o'clock noon, which is the most convenient starting point in applying the device, seen on page 324, Vol. XVII. of this paper, to all maps, as there briefly hinted at.

Much more could be said on this subject, but I will not occupy your valuable time and space.

W. R. SHELMIRE.

Philadelphia, Pa.

Heat Without Coal---Utilization of Wind Power.

MESSRS. EDITORS:—Looking forward to the exhaustion of the fossil fuel which nature affords us in the coal fields, economists have speculated on the possible discovery of some method of producing heat independent of coal, and the decomposition of water has been regarded as a probable expedient. With our present knowledge and appliances it appears not to be difficult to realize this proposition, even in competition with coal, at least in a small way. The agents are obvious, wind-power, a magneto-electric machine, oxygen and hydrogen gas holders, and the electrolysis of water. The products of combustion being only water, they could be burned for room warming without a chimney.

For use in the arts the oxy-hydrogen furnace would of course offer advantages far above any other known, and results could be reached impossible with the lower temperature of the coal fire, while the flame would be free from deleterious substances common to coal.

Owing to its gaseous form and the intensity of its heat this fuel would be manageable in many ways impracticable with coal. For instance seams could be hard-soldered with great rapidity with the jet of the compound blow-pipe, and it is probable that the joints of steam boilers could be heated for welding in a suitable oxy-hydrogen jet.

Newark, N. J. H. W. POND.

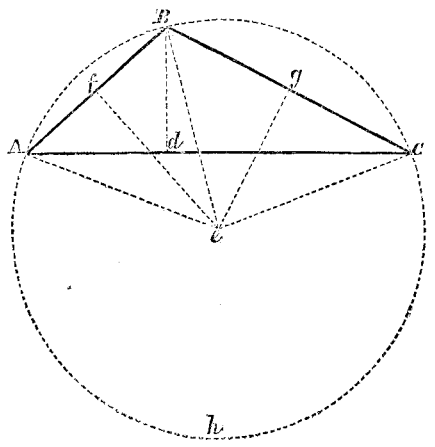
The Cold Cave at Decorah.

MESSRS. EDITORS:—There is at the village of Decorah, near the northern boundary of the State of Iowa, a cave where the operations of nature are reversed. In this cave it is cold in summer and warm in winter. The ice begins to form the fore part of June and disappears again the latter part of August, the coldest period being about the middle of July. On the fourth day of July icicles may be found from six to eight inches in diameter and from four to eight feet long, affording fine sport for the boys who take them into the market for sale. In this cave no ice is found nor sun from September to June, but June, July, and August it is extremely cold so that a man can only stay in it a few minutes. This cave has been known about twenty years and the above facts appear every year. Thousands of people have been into this cave to see icicles in summer. I wish some one would give an explanation of this strange phenomenon through your journal. O.

Hardin, Iowa.

Solution of Plane Triangles.

MESSRS. EDITORS:—Herewith I send you a geometrical problem illustrated by diagram, which has probably never before been in print. In beauty and utility I believe it stands next to the 47th problem of Euclid, which is, that the square of the hypothenuse is equal to the sum of the other two sides. Having this handed down as a text, it was supposed that the same solution might be applied to any triangle. This may be done by letting fall a line from the apex of the angle, opposite the longest side of any triangle, cutting said side or base at right angles, as seen in the figure; the close



line, A B C, represent the sides given, and the broken lines represent the lines required.

To find A d and C d:

$$\frac{A\,B^2+A\,C^2-B\,C^2}{2AC}=Ad \qquad \frac{BC^2+AC^2-AB^2}{2AC}=Cd$$

$$BC^2-Cd^2=Bd \qquad AB^2-Ad^2=Bd.$$

$$Af : Ae :: Bd : BC.$$

$$Bg : Be :: Bd : AB, \text{ etc.}$$

$2Ae\times 3{\cdot}14159+$ equal the circle cutting each angle of the triangle.

Let AC=10, AB=5, and BC=7. Then

$$\frac{10^2-5^2+7^2}{2\times 10}=6{\cdot}2=Cd \qquad \frac{10^2-7^2+5^2}{2\times 10}=\frac{3{\cdot}8}{10}=Ad=AC$$

I have sought for this solution for some fifteen or twenty years, and think that in all probability it will be, sooner or later, introduced into the common school arithmetic. It will be observed in the solution above given that it is necessary to assume the longest side of the triangle for the base. In short the beauty of the problem lies in the discovery of letting fall from the apex of any triangle upon its base a line at right angles with the base, when the base is the longest side of such triangle, and which unlocks all its intricacies to the simplest rules of arithmetic. JUSTUS F. HOYT.

New Canaan, Conn.

Removal of Obstructions in the Mississippi at Rock Island.

MESSRS. EDITORS:—I have seen a report of the wonderful performances of the "chisel boats" on the upper or Rock Island Rapids of the Mississippi, which is somewhat overdrawn. Perhaps you would like to hear the truth. The Rock Island Rapids have been a very serious obstruction to the navigation of the river in times of low water, being about fifteen miles in length and having a fall of about eighteen or twenty feet. Congress at least once before made an appropriation looking to the improvement of the channel, but the work done did not in the opinion of the pilots render the navigation less dangerous than before. The last Congress appropriated $300,000 for the same purpose, and the United States engineers decided to remove the rocks to the depth of four feet below the low water of 1864, the lowest ever seen by the white residents on the banks of the Upper Mississippi. There are seven reefs to be removed. The contract was awarded to C. G. Case & Co., of New York, who built two "chisel boats," three barges, and other craft, suitable for the work, besides buying a steamer and one of the largest and best dredges in the West.

The chisels are raised and allowed to fall like a spile driver, and are made to fall about six times in a minute from a hight of twelve feet. They are cold chisels, pointed, and weigh 6,000 pounds each. They sometimes penetrate the rock to the depth of six inches the first fall, and sometimes drop three or four times without effecting anything; but altogether they are successful. The rock has no stratification, and yields reluctantly to the hardest blows.

The company have also coffered a space of 450 by 250 feet, and are blasting out the contained rock to the depth mentioned before, which will require the removal of 7,000 cubic yards. I send you by express an oyster can full of the most characteristic specimens I could procure. The work is more than half done on this chain (Duck Creek), and the weather all that could be desired. There has been no day in four months that could prevent men from work, and if my memory is right not a drop of rain has fallen here in that time.

THOS. DOUGHTY.

[The samples sent are limestone containing crystals of metallic sulphurets. The rock is favorable to the success of the chiseling process.—EDS.

Momentum and Inertia.

MESSRS. EDITORS:—I venture to offer an answer to that supposed paradox presented under the above title, on page 310, Vol. XVII.

There is no substance in the world so hard as not to yield at the point of contact when two such bodies should meet, as supposed in the problem. Admitting this, it contains nothing impossible or unnatural. The small body comes gradually to a rest, and is then gradually set in motion in the opposite direction, while the larger body continues to move, and loses only a part of its velocity. Within the small interval of time that this occurs, the two bodies come nearer together, while their surfaces yield at the point of contact.

The question is to be decided upon some other point, viz.: What is elasticity, and what makes a body non-elastic?

For example, a piece of lead is non-elastic, why? Suppose it strikes against some hard obstacle, by which it is brought suddenly to a dead rest. While the lead was in motion it carried a certain momentum, or, in other words, a certain amount of native power, and which I call simply "force." This force cannot be lost or annihilated, it can only be consumed by producing mechanical work or effect, for which a reasonable account can be given. What has become of this force, or of the momentum of the lead? This force was consumed by the friction of the molecules of the lead, while it was flattened or split in fragments, or otherwise changed in its shape.

If we take a piece of hard steel, as for example a small hammer, and strike against a heavy anvil of equal hardness, the hammer will be thrown back, why? Because neither of these bodies suffered any lasting indentation, because no mechanical effect has been produced which would consume the force of the blow; consequently this force is returned, and throws the hammer back. This is elasticity.

Glass is elastic to a certain limit. When the force of the blow exceeds this limit, the excess of the force, which is not taken up by elasticity, will break the glass, in consequence of which the force will be consumed and not returned. A piece of pumice, burned clay, or charcoal, is non-elastic, because the force of the blow is consumed by breakage of some minute parts of such a porous and fragile substance.

This may suffice to show that elasticity is nothing else but the manifestation of one of the most important laws of mechanics, the preservation of force, and that if really any perfectly hard and non-elastic substance should exist, the slightest blow must cause some breakage, as may be inferred from the above example of glass. And from this it will be seen, more clearly, that the above problem supposes an impossibility in the premises, since the momentum or the force of the small body cannot be annihilated instantaneously, but can only be consumed by producing some mechanical effect, in consequence of which the surfaces of the two bodies must yield in some way at the point of contact, at least by breakage, if not otherwise. J. G. KONVALINKA.

Astoria, L. I.

Aluminum for Mathematical Instruments.---Folding Machine.

MESSRS. EDITORS;—On page 292, Vol. XVII., I notice an interesting article on "Aluminum, its properties and uses." I am a civil engineer and surveyor, and would like to suggest, through the columns of your highly valuable journal, the advantages of the use of aluminum for the construction of civil engineering and surveying instruments. Accuracy, strength, and lightness are the requisites of a good instrument, the last quality having to give way to the two first, in the construction from the material now used. To illustrate my idea, I will take for an example one of Gurley's solar telescope compasses, with adjusting socket, which weighs 12 lbs.; if constructed of aluminum, with the same sized parts, it would weigh about 3 lbs.; and if the metal is as strong and rigid as it is represented, the thickness could be reduced at least one-fourth, which would make the weight only 2 lbs. 4 oz. I have been informed that aluminum could be obtained in large quantities at from $6 to $8 per lb. (I do not know whether by troy or avoirdupois weight); but say that it is worth $1 per oz. avoirdupois, then the material for the instrument would cost only $36 (I make no allowance for filing and chips, as they could be saved the same as in working gold, and the weight of the glass would compensate for the unavoidable losses in working), from which take the cost of the metal now used, say $4, and it leaves only $32 as the extra cost of an aluminum instrument. Of course, if the metal can be obtained at 50 cts. per oz., the extra cost would only be $14. Now, gentleman, I do not think there is one engineer or surveyor in fifty, who would not pay even $50 extra, for an instrument that weighed only about 2½ lbs., instead of 12 or 14. I think that manufacturers of mathematical instruments would find it profitable to turn their attention to the subject; the first one who does, and lets me know through your columns, will get one order, sure, from the Rocky Mountains.

It would be very interesting to me, and, judging by myself, I think to the majority of your readers, if you could compile an account of the different processes now known and used for the reduction of the metal from its ores. The ores of aluminum are the most common of any known metal, not even excepting iron, and I beg leave to predict that as we now live in an iron age, so will those who live twenty, or perhaps many less years hence, live in an aluminum age. As soon as the right process for the reduction of the metal from its ores is discovered, then we will see an entire revolution in mechanics and civilization, which is now beyond the comprehension of ordinary mortals. Speeds in traveling will be attained which, if told of at present, would appear wild and chimerical; ship building and warfare will be revolutionized; pneumatic railways will be common; the problem of navigating

© 1868 SCIENTIFIC AMERICAN, INC.

the air will be solved; velocipedes and steam carriages for common roads will be as common as horse conveyances are at present; grades can be established on railways that are now perfectly impractical, and other improvements made in mechanics and engineering that are not now imagined by the most far-seeing thinker. For in the metal aluminum we have combined the maximum of strength and durability with the maximum of weight. The day is not distant when some person will discover the right process. Many more wonderful, and seemingly more difficult processes, have been brought to light in the past few years. Now, in order to give the inventive public (who all take the SCIENTIFIC AMERICAN, or ought to) a cue to the future process, please give them all the information you can in reference to the subject, and let them go to work, and they will soon ferret out the simple process needed.

I believe you like to have hints thrown out to inventors, so while I am in that line of business allow me to suggest that some inventor get up a machine to fold quarto and octavo papers; for instance, the SCIENTIFIC AMERICAN comes to me sometimes terribly askew. I am always too anxious to read it to take time to refold it and straighten out the creases before cutting, and therefore spoil the paper for the binder, and sometimes even cut the reading matter. I think you will bear me out in my assertion that some sure and easy way of accurate folding is a desideratum to both the publishers and readers of newspapers of a "several-fold-up" form.

Please hurry up your prospectus. Our club was euchred out of six numbers of the SCIENTIFIC AMERICAN by being so far away that we were not in time, and we cannot afford it again; besides, the "Noble Red Man" was in quest of science, and overhauled the mails, depriving us of eight or ten more copies. The SCIENTIFIC AMERICAN is just as welcome a visitor out here in the Rocky Mountains as it was back in "America." Our prayers are for our weekly SCIENTIFIC AMERIFAN," as well as for our "daily grub." "ALUMINIST."

Helena, Montana.

[Aluminum is prepared from cryolite, a compound of sodium, fluorine, and aluminum, procured mainly in Greenland. It is mixed with common salt and sodium, in the proportion of about 270 parts by weight of cryolite, 150 of salt, and 72 of sodium, and melted in a crucible. No feasible and cheap method of reducing the metal from ordinary clay has yet been discovered.

Folding machines for newspapers are in common use, but as a general thing they do not equal, in exactness of work, hand labor.—EDS.]

Extermination of Cockroaches.

MESSRS. EDITORS:—We have been greatly troubled for two or three years by roaches, the real, big, black fellows. By continued exertion we confined them to the vicinity of the furnace and range, but to exterminate them all sorts of traps and exterminators proved ineffectual. Somebody told us of Paris green, and it has done the work. We feel so rejoiced that we desire to give the knowledge to the public. Paris green can be procured at any apothecary store. Just sprinkle it round where "they most do congregate."

B. F. BURGESS, JR.

Boston, Mass.

NAPHTHALIN AND ITS USE.

Naphthalin was discovered in 1820, by Garden, among the products of distillation of coal, and has since been the subject of thorough investigations of Faraday, Liebig, Woehler and many other chemists. Laurent occupied himself especially with its derivates, and founded thereupon his new theory of organic compounds. Up to the present time naphthalin only was of scientific interest, and of a very limited practical use, when in 1860 Roussin, a French chemist, by his repeated experiments at once drew the attention of the scientific world to this hitherto so-considered worthless substance. He succeeded, namely, in producing a dye-stuff from it which he considered the *alizarine* of the madder, but which, though identical in its chemical composition with the natural *alizarine*, has subsequently been found to be very dissimilar to it. It therefore became suddenly lowered in the estimation of those whose interest was connected with it, and was subsequently looked upon as being as worthless as before, the more as other coloring matters which had been prepared from the same substance met with the same fate. Quite recently, however, European investigators have succeeded in producing benzoic acid from this hydrocarbon, a substance largely used in the preparation of tobacco sauces, in calico printing, in the manufacture of aniline blue and benzol, respectively nitrobenzol and aniline; and it is therefore that I call attention to this subject. I first will describe the

PREPARATION OF NAPHTHALIN.

Although this hydrocarbon (its formula is C_{20}, H_8) is a product of the distillation of coal, it does not pre-exist in them, as is the case with paraffin. [I have, in the laboratory of Prof. Bolley, in Züric, extracted small quantities of paraffin from boghead coal. The coal was previously pulverized very finely, and the extraction was performed by cold ether.] It is only generated at a high heat, such as that of the retorts in gas works when in full operation. In the manufacture of gas comparatively large quantities of tar are obtained, the conversion of which into permanent gas has puzzled the ingenuity of inventors since the first introduction of gas illumination on a large scale, and still remains an unsolved if not an insoluble problem. In distilling this tar, and in only gathering those portions which run over between 400° and 500° F., we get the so-called "pitch or dead oil," which is employed for the extraction of napthalin. The residue remaining in the still is the substance into which the blocks of Nicholson's pavement are dipped, previous to their being inserted in the street.

According to a paper recently published by Dr. Vohl, the pitch oil should be put in vats and left in a cool cellar from six to eight days, after which time most of the napthalin will have crystallized out. The latter is then filtered from the liquid portions and transferred into a centrifuge, for the purpose of separating it from the adhering oil, but as this cannot be arrived at at once, the crude naphthalin is then subjected to hydrostatic pressure, commencing with a light pressure and increasing gradually until completed.

The pressed mass is then put into an iron vessel, which is heated by steam; in order to take up the creosote, the phenylic acid and other impurities, it is first melted with a small percentage of caustic lye, and stirred well; after a while the lye is drawn off, the same process being then repeated. After this the napthalin is washed with boiling water, then it is treated with oil of vitriol of 45° Baumé, and finally mingled again with lye and left at 212° F. for three hours.

The naphthalin being thus treated is poured into a cast iron still, which can be heated on an open fire. It commences to flow over at 410° F., in a thick stream, and in twenty minutes generally 20 to 25 per cent of napthalin may be obtained. The water of the condensing tank must be kept at 170° F., the receiver being also kept in water of this temperature. When the latter reaches 450° the distillation is fractioned, as then an oily yellow product is obtained. Finally the liquid and purified distillate is run into conical cylinders of glass, metal or moistened wood, in which it solidifies rapidly, and in contracting separates from the sides. It is thereby obtained in sticks, like solid brimstone.

PROPERTIES OF NAPHTHALIN.

The naphthalin thus obtained is of great beauty. It forms brilliant, white, crystalline sticks, in which the interstices and crystalline vegetations have the appearance of spirals. Its specific weight is 1.151 73, its melting point 174°, and its boiling point 452°. The following new properties are added to the already known ones by Dr. Vohl, in Cologne. When a naphthalin stick is rubbed with a silk cloth it gets strongly negative electric. Melted naphthalin absorbs a great amount of atmospheric air, which it gives off in cooling. When put in quantities of from one to two pounds the expulsion of the air is so turbulent at this stage that the liquid appears to be boiling. The air absorbed by melted naphthalin is abounding in oxygen; perhaps it is pure oxygen. This phenomenon has therefore a great similarity with the peculiar movement taking place in the cooling of silver, and called "spratzen," in German. Melted naphthalin dissolves indigo with great ease, forming a dark-blue violet liquid, from which, in cooling, the indigo separates again, in brilliant copper-like needles. The sulphurets of arsenic, tin and antimony are taken up abundantly in their amorphous state, in cooling they separate in crystals. Phosphorus and sulphur are also solved rapidly by liquid napthalin.

TEST FOR NAPHTHALIN.

To detect this hydrocarbon in a product of distillation, the latter is, according to the writer of this, treated with fuming nitric acid, in order to transform the napthalin into its nitrocompound; this being insoluble in and lighter than water, it will rise to the top. It is then gathered and converted into naphthylamin, by any known method. The best is that of Béchamp, who uses iron filings and acetic acid. In adding chloride of iron to an alcoholic solution of the naphthylamin a deep blue color will be produced.

ITS TRANSFORMATION INTO BENZOIC ACID.

The first step in the two or three processes known, is the production of naphthalic acid, a body of the chemical formula C_{16}, H_4, O_6. While, however, the brothers Depouilly, in Paris, directly convert the latter into benzoete of lime, separating therefrom the benzoic acid, Laurent and Casthelay change the naphthalic acid successively into phtalamid, benzonitoil and benzoate of soda, a process lately fully described by me in one of the meetings of the New York Polytechnic Association. The method recommended now by high scientific authorities is a combination of a French and German one, namely, of

a. The process of Dr. Vohl for the preparation of naphthalic acid, and

b. That of the brothers Depouilly, as indicated.

Naphthalic Acid.—While hitherto naphthalic acid was obtained by a very tedious way of preparation, which was not only injurious by the highly irritating gases escaping, but also yielded a small percentage, it may now conveniently and cheaply be produced by the process invented by Dr. Vohl. According to the same, 12 parts of naphthalin are dissolved in 109 parts of concentrated oil of vitriol, and to this 89 parts of finely pulverized bichromate of potassa are gradually added. The reaction ensuing being over, the product is solved in boiling water, and the liquor thus obtained is oversaturated with carbonate of soda; it is then left to settle for a quarter of an hour. By filtration, a rich orange-colored liquid is obtained, which, in evaporating on the water bath, yields the naphthalic acid.

Benzoic Acid from Naphthalic Acid.—This process is based upon the fact that naphthalic acid in presence of a surplus of an alkaline base (lime), and at a temperature of 625° to 660° F., is changed into benzoic acid. The process, however, has to be performed in vacuum.

The brothers Depouilly indicate the reaction taking place as follows:

Naphthalate of lime=C_{16}, H_4, O_6+2 Ca, O, and hydrate of lime=Ca, O, H, O, yield in heating to the above temperature.

Benzoate of lime=C_{14}, H_5, O_3+Ca, O, and carbonate of lime=2 (Ca O, C O_2).

As seen from this equation, decomposition of water and formation of carbonic acid is taking place. As the success of this operation, however, is often depending upon mere chance, it requires great skill and practice. From the benzoate of lime, the benzoic acid is separated by hydrochloric acid. In distilling the naphthalate of lime in presence of lime, *benzol* is formed, an operation which is nearly always of success.

NAPHTHYLCARMIN.

If the orange-colored liquor, containing the naphthalic acid—vide above—is oversaturated either by hydrochloric or sulphuric acid a precipitate in floes of a most beautiful carmoisin red is obtained. The same is undoubtedly identical with the *carminnaphte* of Laurent, which this investigator obtained once in heating naphthalin with bichromate of potassa and sulphuric acid, but could not produce again at any subsequent trial. This substance combines readily with alkalies, yielding yellowish-red lacs, and dyes silk and woolen without mordants, either orange or violet red. It is soluble in acetic acid and alcohol, and is precipitated again from its compounds by mineral acids.

On the Formation of the Diamond.

Researches on this subject have lately been made by Messrs. Goeppert and D. Brewster. The black diamond of Bahia is, according to Mr. Goeppert, a mixture of amorphous carbon and diamond. M. Liebig's experiments on its combustion also agree with this statement. It often happens that the diamond incloses other crystals; iron pyrites, particularly, have been noticed in it by Mr. Hartwig. Sir David Brewster calls attention to the microscopic cavities existing in this as well as in other gems, as in the topaz and emerald. These cavities are found to be often very numerous in certain dark diamonds, they thus dispersing the rays of the light, are therefore of no value in jewelry. Mr. Goeppert remarks that the diamond must originally have possessed a certain plasticity; we notice, in fact, in a diamond belonging to the emperor of Brazil, the impression yet of a sand grain. The black as well as the crystallized white ones bear also the signs of analogous impressions produced by foreign bodies. Some investigators believe to have recognized the cellular tissue of plants in the ashes resulting from the combustion of this gem. Mr. Goeppert, however, has not yet detected with certainty any traces of organization, neither in the diamond nor in its amorphous form, the plumbago. As to the question so often discussed, whether the diamond be formed by platonic or neptunic action, the latter naturalist is of the opinion that the first hypothesis is scarcely admissable, the experiments of Depietz having shown that the diamond is changed into a kind of coke, whenever exposed to the intense heat of a galvanic battery. The second hypothesis, attributing its formation to neptunic action, is sustained by the authorities of Newton, Brewster, and Liebig, being also that which is best in accordance with all that is known about the gneiss, itacolumite, and the metamorphic rock in which it is found. The character of these rocks, however, do not allow us to attribute to them a plutonic origin.—*Cosmos.*

A Daring Explorer.

At the last meeting of the California Academy of Science, a letter was read from William H. Dall, Chief of the Scientific Corps of the Western Union Telegraph Company, dated at St. Michaels, Alaska Territory, and acknowledging his election as corresponding member of the Academy. When the telegraphic party returned from the wilds of those northern regions, as we noticed in a late issue, this gentleman remained behind to prosecute scientific researches and gather information respecting this country. That the work he has undertaken to perform is no easy one, an extract from his letter will show. He says:

"I have traveled on snow shoes about 400 miles, camping in the open air, with the thermometer from 8° to 40° below zero. I have seen the thermometer down to 68° below zero. In the spring I started from Nulato, on the Yonkon River, where poor Kennicutt died, and paddled up stream 650 miles in an open canoe to Fort Yonkon, being the first American to make the trip, and one of the only four men out of the whole expedition who have been there. We met two adventurers returning from a trip of 600 miles further, and all hands came down together to the sea and round to St. Michael—a nice little trip in an open canoe of 1,300 miles. We had plenty of rain the last part of the journey, and made the trip in 16 days. This is the first trip ever made to the sea from Fort Yonkon direct. I have acquired sufficient knowledge of Russian and one or two Indian dialects to get along very well. I do not like the country. It is full of mosquitoes in spring; the summer is constant rain and fog, and the only pleasant time is the winter, when it is very cold. But in consideration of the work, I can stand it another year."

NEW GALVANIC BATTERY.—We have had in use in our laboratory a most singular looking piece of apparatus, devised by Moses G. Farmer, Esq., the well known electrician of this city. It is a new form of instrument for converting heat into electricity, and most satisfactorily does it perform its work. All that is necessary to put it into active operation is to light a gas jet, and in a few moments the electrical impulses are manifested, and the battery is ready to be set to work. It deposits metals with great facility, and the development of the agent is constant and uniform so long as the heat is supplied. It resembles a "fretted porcupine" as much as anything we can compare it with. The metals employed in its construction are antimony and copper. The strips or arms of copper protrude outward from the bars of antimony, so as to secure the cooling influence of an air current, while the gas is heating the other extremity. A portion of the heat of the flame is transformed over into electricity, thus showing the easy convertibility of one imponderable into another, and the correlation of the forces.—*Boston Journal of Chemistry*

© 1868 SCIENTIFIC AMERICAN, INC.

Skating Rink.

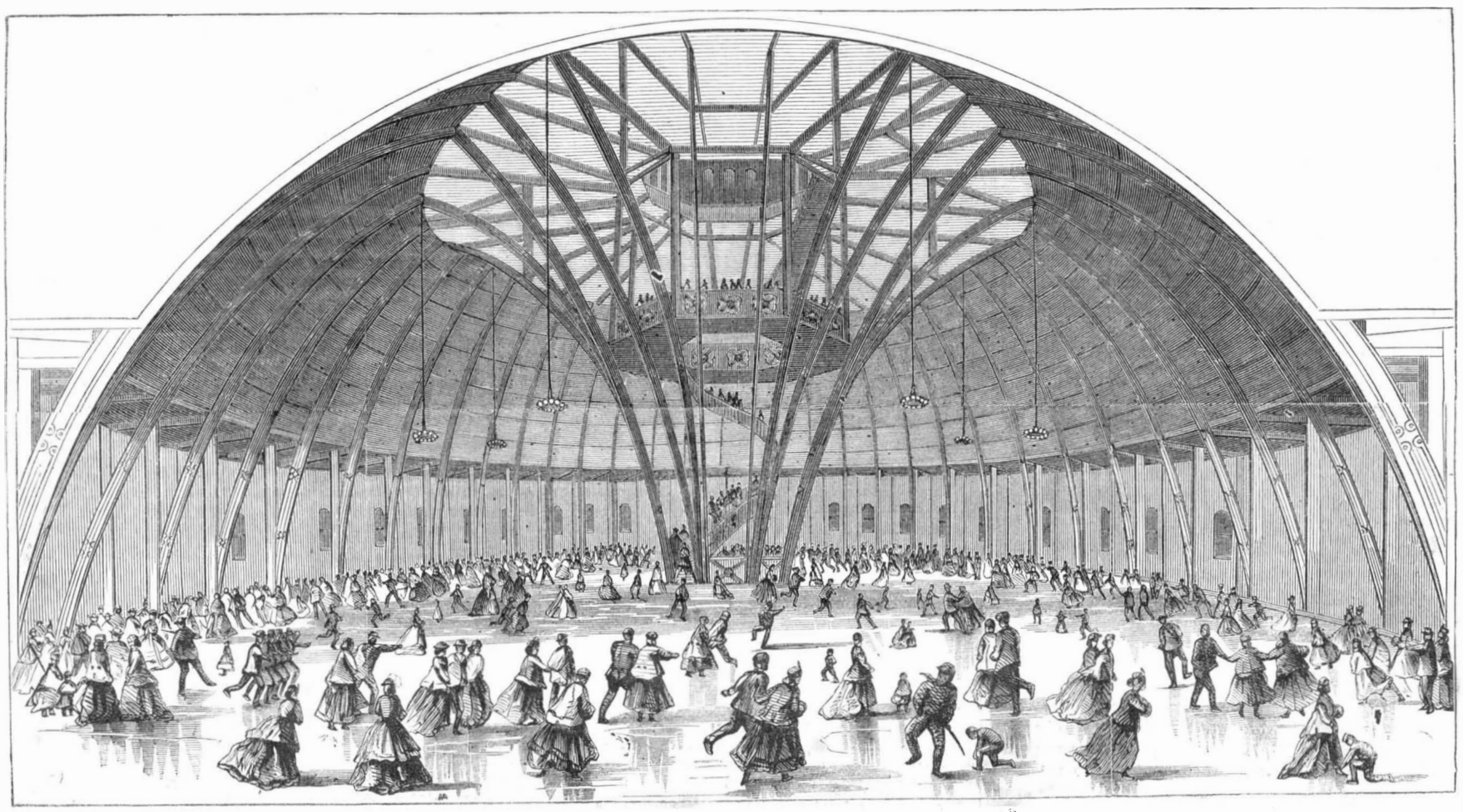
In the vicinity of the Central Park, New York City, several enterprising persons have caused whole blocks of ground to be flooded, and on the margin of the pond have erected temporary buildings, for the use and comfort of skaters, and the bands of musicians who play enlivening airs during the afternoons and evenings of the skating season. The proprietors call their respective places skating rinks; but in true terms they are simply skating ponds, unprotected from the weather. But young and old, in large numbers, patronize these ponds when the ice is good, and the scene is very enlivening to the beholder, and exhilarating and improving to the skater, the "poetry of motion," as in dancing, being kept in harmony with the music.

But our British neighbors are far in advance of us in providing comfortable and artistic places for the enjoyment of skaters; and we hope, by presenting a view of the best skating rink we know of, to stimulate the exertions of our people to making similar erections in our own cities. Our climate is not so favorable as our neighbors' for enterprises of this kind, but the receipts for even a short season would be very good in a city of the size of New York, and we think it would pay.

From *Harpers' Weekly* we extract the following description of the rink at St. Johns, N. B.:—

"In the British Provinces, where the rink exists in its full and sublime perfection, we find structures as spacious and graceful as a World's Fair palace, whose crystal floors are nightly renewed and polished to gleaming by the biting frost. Each night the icy arena is planed by a machine and flooded to the depth of an inch; and then, through every opened door and window, the keen air is admitted to harden and glaze the surface for the next day's sport. From December until March, throughout the long and dreary winter, the rink affords the chief and constant center of attraction; before it all other festivities pale their fires.

"All the chief cities of Canada boast their skating rinks. Montreal has a model one; but for extent, adaptation to the purposes for which it is designed, and beauty of detail, that at St. Johns, N. B., unquestionably bears off the palm. This rink is owned by an incorporated stock company. The main structure is of circular form, 160 feet in diameter, and covers an area of 20,000 superficial feet. It is an immense dome, resting upon perpendicular walls 20 feet high and pierced with 39 windows, and is surmounted by a graceful cupola, or lantern, the apex of which is 80 feet from the ground. This lantern contains 24 windows, throwing light directly into the interior of the structure. Within, and girting the extreme circumference, is a platform, or promenade, 10 feet wide, for the accommodation of spectators. In the center is a circular framework containing a spacious stand for the band, from which a spiral iron staircase ascends to two circular galleries, one above the other, the highest 50 feet from the ground, whence a bird's-eye view of all that is passing below can be had at a glance. From this focal point also spring the supporting rafters that form the huge dome which constitutes the chief feature of the design, producing an effect airy and graceful in the extreme: it cannot be better described in terms unarchitectural than to liken it to a fountain whose waters, springing from the center, fall in majestically-sweeping curves to the outer perimeter. All the area between the hand-stand and the circular promenade is covered with ice, which is flooded daily from the City Water-works. The outside front is two stories high, with decorated entablature, and contains waiting and refreshment rooms, dressing-rooms, and the residence of the janitor. The whole edifice cost about $12,000, and is in every respect creditable to the projectors and an ornament to the city.



SKATING RINK AT ST. JOHNS, NEW BRUNSWICK.

The Dignity of Labor.

"Spice," of the Boston *Commercial Bulletin*, relates the following: "We were never more impressed with the dignity of labor than while witnessing, a few days since, a group of 'down-trodden workingmen' engaged in setting up some machinery. There were five of them, or rather four men and a boy, and when they came under our notice, 5:30 P. M., one was engaged in slowly turning over the contents of a box, in search of a screw; two were looking with much interest for the result of the labors of No. 1; the fourth was slowly scratching a piece of iron with a file, and the boy was scratching his head. No. 1 finally found a screw to suit him, but during the search his pipe had gone out. Laying down the screw, he began to investigate his pocket for a match. Nos. 2 and 3 searched theirs in sympathy, while the filer paused to see the result. Finally No. 2 found a match, ignited it, and handed it to No. 1, who, having accomplished a light, smoked for a few minutes to assure himself of the fact, while the boy went to the other end of the room to look at the clock. No. 1 then looked at his watch, and compared time with No. 3. Time, 5:40. No. 1 then leisurely put the screw into position to fasten a bar. No. 2 held the bar; No. 3 squinted at it from the other side of the machine; No. 4 inspected the whole operation reflectively, as he slowly resumed the filing, and the boy wiped the oil from his fingers. Time, 5:45. The entire labor was now suspended, while the boy was sent across the room for a necessary tool. Just then it occurred to No. 2 that a chew of tobacoo was necessary to his comfort, and, as his supply was out, he applied to No. 3 for the weed, and to No. 2 for a knife to cut it with. No. 1 consulted his watch again. Time, 5:50. And labor was resumed, the screw was turned home; No. 1 tried the bar; Nos. 2 and 3 engaged in a playful scuffle, and the boy looked on with a grin of admiration. The filer laid down his work and looked at his watch, and announced it six o'clock. Tools were instantly dropped, and the five, having accomplished the work of two ordinary men, went cheerfully home."

Editorial Summary.

AMPUTATION NOT ALWAYS NECESSARY.—The *British Medical Journal* calls attention to the fact that several of the men who were wounded in the New Zealand campaign, have brought home arms and legs, which, according to the standard rule of military surgery, they ought to have left behind. Out of six cases of gunshot fracture of the femur, five recovered without amputation, four of them with very useful legs. Of ten cases of gunshot fracture of the humures, eight reunited solidly, and in only one case was amputation resorted to, and that was primary. Guided by the experience of these cases, the surgeon-general says, it would be fair to expect, that, when eighty per cent of gunshot fractures of the humerus recover without difficulty, that amputation in such cases might be delayed for a second operation, if after all found necessary.

UTILIZING SEWAGE.—At Sandon, Isle of Wight, the sewage is conveyed in pipes clear of the town into cesspits, where it is filtered and deodorized by a chemical process. The clear portion finds its way into the sea miles away from the town, and the solid residue is mixed with ashes and road sweepings, and forms good manure.

ARTIFICIAL TEETH.—They should never, under any circumstances, be worn at night, and for this reason: it is a physiological fact that bone, in a normal condition, is constantly undergoing a process of removal and replacement of particles, and that continuous pressure pervents the complete restoration of the parts, causing what is commonly called absorption. The osseous structure of the mouth is protected only by a thin covering of muscular tissue and mucus membrane, on the firmness and elasticity of which it depends for protection against the pressure of the plate; but when constantly excluded from the atmosphere, especially by hard rubber, which being a poor conductor of heat, keeps the part covered at nearly an equable temperature, these tissues lose their elasticity and become spongy and fungoid. Two very undesirable results are thus arrived at. The mouth is reduced to an abnormal condition, and the plate no longer fits well, which is just what the patient has been trying to avoid by wearing his plate at night.—*Dental Cosmos.*

A CANAL ON FIRE.—In an investigation as to the condition of the rivers Ayre and Calder, which water the great towns of Yorkshire, it was found that the fluid of Bradford Beck, the source of supply to the Bradford canal, was so corrupt from sewerage, that in summer large volumes of inflammable gases were given off; and although it has usually been considered an impossible feat to "set the river Thames on fire," the boys found it practicable to set the canal on fire, the flames rising six feet high, and running along the surface of the water for many yards, enveloping the canal boats, to the great terror of their passengers. That this state of things is not limited to one district was abundantly proved by inquiries at other towns.

THE SUEZ CANAL.—It has been announced that this great undertaking was in such an advanced stage of completion, that already an English vessel had passed through to the Red Sea. It now appears that the vessel was a Government tug-boat, which was to assist in the embarkation of the Indian troops at Suez, and, that after being lightened as much as possible, even to the removal of the paddle wheels, a number of empty casks were placed under her, and in this manner she reached Suez.

SHFET IRON RAILROAD SLEEPERS.—A curious plan for a temporary railway, to be laid for the benefit of the English forces in their excursion to Abyssinia, has been proposed by a Mr. Hadden. The peculiarity consists in making the sleepers of flattened cylinders of sheet iron, closed at one end, and which are to be filled with sand or gravel well packed. The sleepers are then to be laid on the ground with little or no ballast, and the rails secured to them by clip pieces, so as to be easily removed when desired.

THE thin metallic tubes used for holding artists' colors, are made by placing a disk of block tin in a die or cylinder into which a punch is slowly forced by hydraulic or other pressure. The punch fits the cylinder almost exactly, and the tin rises into the intervening annulus, as if it were a liquid, its constituent particles being made to move over each other as they would do if the tin were melted by heat.

AN OLD PIECE OF ORDNANCE.—The Turkish Sultan has given to the British government, in exchange for two large Armstrong guns, a monster gun, twelve feet long, thirty to thirty-six inches in exterior diameter, and weighing from twelve to fifteen tuns. Its chief value is its historical one, being one of the pieces of ordnance used in the memorable siege of Constantinople, by Mahomet II, in the year 1453.

© 1868 SCIENTIFIC AMERICAN, INC.

WALKING STONES.—We have noticed in this column the "walking leaves" of Australia, and now give our readers the benefit of a statement that has fallen under our notice, of some "traveling" pebbles found in Nevada. They are described as almost perfectly round, the size of a walnut, and extremely hard. When distributed about upon a flat surface, when even separated two or three feet, they immediately gravitate toward a common center. At a distance of five or more feet, the attraction ceases. These stones are found in a very rocky region, which abounds in little basins hollowed out of the rock, from a few feet to a rod in diameter, and in the bottom of these the stones are congregated. We would suggest that perhaps the common phenomenon of the "eye stones"—calcareous concretions — which, when placed in a nearly flat porcelain dish with an acid, as vinegar, will tend gradually toward a common center, receives an illustration, probably, in the above. The effervescence occasioned by the combination of the lime and the acid is sufficient to overcome the weight of the pebbles and the inclined sides of the plate or the natural basin accomplishes the rest.

EFFECT OF ELECTRICITY ON SEEDS.—M. Blondeau asserts that, after many experiments, he has found the action of an induction current on seeds, before planting, produces very beneficial results, noticeable in their subsequent growth. In experimenting with beans, peas, and cereal grains, the seeds were soaked in water for some time, and were then submitted to the action of a current for several minutes. After this they were planted in pots filled with good garden earth, and at the same time other unelectrified seeds were planted and kept under the same conditions for the purpose of comparison. The former always came up first, grew more rapidly, and gave much more vigorous and fruitful plants than the latter. "But," says M. Blondeau, "one very singular fact is that many of the electrified seeds obstinately persisted in growing with the true root pointing up in the air, while the plumule was directed downward;" which gives a little shade of incredulity to the whole statement, but the experiment is an easy one for any interested person to try for his own satisfaction.

A NOVEL HITCHING POST.—The party comprising the Russian American Telegraph Expedition, on their return from the northern region, have brought home many interesting relics. An ivory tusk twelve feet long and measuring seventeen inches in circumference, was purchased for twelve leaden bullets from Indians living in the new territory of Alaska. Near the junction of the Anadyr and Myan rivers the party found a tusk of enormous size sticking some six or eight feet out of the ground and endeavored without success to dig it up. The frost in the ground held it so firmly that they were not able to ascertain whether the other bones of the mastodon were beneath or not. The Indians said that they had used it as a hitching post for many years, and that was all they knew or cared about it.

CHINESE TEA GROWN AT HOME.—In our number for Sept. 28, 1867, we gave a description of Dr. Alfred L. Acee's plantation of tea, at Rose Bower, near Bellevue, Talbot County, Ga. We have now the pleasure of acknowledging the receipt, by express, from Dr. Acee, of a few living tea plants grown by him, together with some of the nuts. We have placed the plants in our green house, and intend to raise some tea from the seed. Dr. A. is entitled to much credit for his perseverance in demonstrating the feasibility of raising tea on this continent. The plant forms an ornamental evergreen shrub, and may be readily cultivated in many parts of the country. Dr. A. states that it blossoms in the fall, that it bears exposure even to freezing sleet, and may be cultivated anywhere in the open fields without manure.

CRYSTALLIZED EGG.—Numerous and of very varying values are the recipes for preserving eggs, which have been given to the world, but a company of this city believe that they have at last attained perfection in this line, though attaining their end in a novel way. Their process is as follows: The fresh eggs are emptied from the shell into a long trough, and into this trough descends a shaft armed with a series of metallic disks, which, rapidly revolving, beat the eggs into homogeneousness, and are themselves covered with a thin covering of egg. This thin pellicle, when dried, is scraped from the disks in the form of thin granules, apparently crystallized, and retains indefinitely all the peculiar properties and flavor of the fresh egg.

FERTILIZING PLANTS.—The old idea of botanists that hermaphrodite flowers shed their own pollen upon their own stigmas is now generally discarded, as observation has shown the almost infinite variety of contrivances which Dame Nature furnishes to prevent this. It has been recently noted that the insect world plays a very importat part in the fertilization of certain plants in conveying the pollen from one flower to another. Another remarkable fact in this connection is that almost all flowers which are thus fertilized are gaily colored so as to be attractive to insects, and Mr. Darwin observes that he knows of no flower fertilized exclusively by pollen blown on the wind, that has not a dull unattractive appearance.

COFFEE-TEA.—We have made frequent mention of the experiment which, if reports are true, has been highly successful, of raising the true Chinese tea-shrub in our Southern States. An exchange calls attention to a new branch of industry in this line, which is capable of still more extended cultivation. It is customary in Sumatra to use the roasted leaves of the coffee plant for the production of a drink having all the properties of the best of tea, and containing nearly 1.25 per cent. of its peculiar principle. The preparation of the leaves is much simpler than that required for the true Chinese tea, and the cultivation of the plant can be carried on in more northerly countries, where the coffee berry itself would never fully ripen.

A NOVEL MODE OF PASTURING SHEEP.—A grazier in the Pas de Calais, named Pentefort, has introduced the following singular method of economizing his green crops: Over the whole field is placed a rack or fence, so made that the sheep cannot jump over it, but must feed between the bars; and when all the herbage within their reach is consumed, the rack is moved forward, so as to give them a fresh supply of forage. Regularity in cropping and great economy result from the employment of this singular system.

CARBONIC ACID BATHS.—At Piermont, in Germany, there is a natural spring of carbonic acid gas, the sides of which have been walled up, and steps laid for entering it. The well is shallow, and the gas fills it to a depth of about four feet, so that the gas rises about to the middle of a person standing in the well. The effect of the gas in contact with the skin is said to be a peculiar pricking sensation, but not so unpleasant but that such baths have come to be very much in vogue.

MANUFACTURING, MINING, AND RAILROAD ITEMS.

Samples of ore from the Industry silver mine, in Maine, have been assayed by the Massachusetts States assayer and found to average 8 ounces, 60 grains of silver per ton. An interesting fact regarding this mine is the discovery of silver in magnesia, and white or gray pyrites.

From a list of railroads in California, prepared by the Secretary of the Interior, it appears that up to July 1st, 1867, there were a fraction less than 300 miles of railroad track completed and in running order in that State, with an additional length of 1,142 miles, now being constructed.

Machine belting is manufactured of paper by Messrs. Crane, at Dalton, Mass., and is in use in several New England mills. One of these paper belts measures seventy-five feet long and eight inches wide. Patents have been secured in foreign countries for this invention, through this office, and the article promises to become the subject of much importance.

Notice has been served on the workmen in the iron trade in Middlesbro' and the Tees District, Darlington, Witton Park, and other parts of the north-east of England, that the masters intend to reduce their wages on the 7th of December. The notice has been issued in consequence of a meeting of the Ironmaster's Association, at Newcastle-on-Tyne, and it is thought that the reduction will average about ten per cent. The men at the Albert Works, Darlington, have accepted a reduction.

The survey of another trans-continental railway route, which shall follow mainly the thirty-fifth parallel of latitude, is nearly completed. Its projectors claim this as the most feasible one across the continent, and even if the Northern and Southern roads are constructed, this would still be the favorite popular thoroughfare, and the easiest and cheapest built.

From lack of economy, in production of ores, it is estimated that the aggregate loss on the production of bullion of this country for the present year, will reach the round sum of $25,000,000.

Many of the very best locomotive builders in France and Belgium still adhere to the plan of packing their cylinder heads with wire gauze and red lead paint, an antiquated practice long since discarded in both this country and England.

In Brazil, Clay county, Indiana, there is found a species of coal which in appearance and gravity resembles charcoal, having even the woody fibre of the latter. So valuable is it for smelting purposes that one furnace in St. Louis is using five car loads a day, and its existence needs only to be known to increase the demand from other establishments indefinitely. In the same neighborhood is also found an abundance of native iron ore of a superior quality, and a number of iron men from Ohio and Pennsylvania have lately been investing heavily in real estate, and the erection of mills and furnaces in this section.

During last year there were 181,099 tuns of new, and 236,834 tuns of re-rolled rails made in the United States. During the same period we imported about 100,000 tuns, making the total consumption of rails in 1866, 517,933 tuns of 2000 lbs.

It has been calculated by Prof. Breithaupt that during the six hundred and forty years, dating down to 1825, which the mines of Freiburg have been worked, not less than eighty-two thousand hundred-weight of silver have been raised, and that the amount yielded in 1850 alone was not less than eight hundred thousand thalers.

There remains to be built to complete all railroad communication across the continent, 1,070 miles of road. As about 700 miles have been built within little more than two years, it is not unreasonable to expect that the remainder will be completed in the time anticipated—say in 1870.

Our Canadian neighbors are now very much exercised over the selection of a route for the new Intercolonial railroad, which is to bind the various members of the new Dominion more closely together. The road is to run from Quebec to Halifax, through the lower part of what was Lower Canada, but now called the Province of Quebec; New Brunswick and Nova Scotia. Three routes have been proposed, and consequently the war of local interests runs high. Of these, the frontier line runs through the most thickly settled regions, but in case of war with us, the Canadians fear the road would be too easily destroyed. The same reason holds good against the second or central route, the northern route being preferred by the Government officials. Toward the construction of the road, the English Parliament is to guarantee a loan of $15,000,000, which will probably cover the cost of construction.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

MANUFACTURE OF STEEL.—James R. Bradley and Moses W. Brown, Chicago, Ill.—This invention relates to an improved process for manufacturing steel of various kinds and grades, and consists in improvements in the composition of mixtures for treating malleable iron.

HOISTING JACK.—S. B. Rittenhouse, Plymouth, Ind.—The object of this invention is to provide a small and portable machine through which a very great power may be obtained for the purpose of hoisting heavy weights, or propelling heavy bodies, or exerting a great force in any direction, as propelling a ditching machine, or a plow for laying drain tile.

INHALING TUBE.—Samuel W. Sine, Easton, Pa.—This invention relates to an instrument which is used for inhaling gas, or anæsthetic agents for producing insensibility in surgical, dental, and other operations, or for other purposes.

BOOT-TREE.—F. S. Wilt, Allentown, Pa.—This invention relates to a method of constructing boot-trees, and the invention consists in an arrangement whereby the leg and foot of the boot are treed or expanded simultaneously, by operating a single lever nut on the upper end of the tree.

IMPROVED AUTOMATIC RAIN CONDUCTOR.—James B. Hudson, Fayetteville, N. C.—This invention relates to on apparatus for conducting water into cisterns or tanks, and has a conducting disk to oscillate on pivots, and connected with a float, whereby the said disk is made to reverse its angle of inclination and deliver the water into a waste pipe, when the water in the cistern reaches a certain point.

ASH HOUSE.—Moses Hall, Osborn, Ohio.—This invention consists of a hopper and screen upon a fire-proof ash box, and the whole placed upon a leach tub; said leach tub being provided with a screen or perforated plate through which the lye passes off.

CASE OR BOX FOR PRESERVING CORPSES.—P. Wendhiser, Rockville, Conn.—This invention relates to a case or box for the preservation of corpses, which box or case is constructed in a novel and peculiar manner, whereby it is rendered extremely efficient and desirable, as well as serviceable, for the purpose intended.

GENERATING AND SUPERHEATING STEAM.—George Miller, Melbourne, Victoria.—This invention relates to the manner in which steam is generated and superheated, and to the means by which the pressure of the steam is regulated, and also to the manner in which the temperature is concentrated, and consists in providing, in connection with a furnace or fire box, generating pipes or tubes wherein the water enters and is converted into steam, and also superheated.

PLOWS.—S. J. Leach, Tuscaloosa, Ala.—This invention has for its object to furnish an improved plow provided with a detachable facing formed of wood or other material, to which adhesive soils will not adhere and clog the plow, which shall be cheap, more durable, and more effective than the plows ordinarily used in such soils.

LAND CONVEYANCE.—G. F. Krolipfeiffer, New York city.—This invention relates to an attachment for sleds, sleighs, and other classes of land conveyance, whereby sleds or sleighs can be propelled over the ground or other surface, by means of the direct action upon the ground of a lever or levers, so hung to the body of the sled or other vehicle as to be suitably operated by a person or persons within the same, or by other power, either hand or mechanical.

BOAT LOWERING APPARATUS.—A. F. Crosman, Lieut. Commander, U. S. N. This invention relates to a new and improved means for detaching boats from davits, and it consists in a novel manner of applying the davits to the vessel, whereby the former may be made to project out from the vessel, more or less as required, in order to prevent the boat, while being lowered, being thrown against the side of the ship by the action of the waves.

LANTERN FOR STREET RAILROAD CARS.—L. V. Badger, Chicago, Ill.—The invention is to obtain a signal lantern for street railroad cars, which may be applied to any car without difficulty, be readily changed from one car to another, and have the advantage of being capable of adjustment in a more conspicuous place than those now used.

STOVEPIPE DAMPER.—D. Manuel, Boston, Mass.—This invention relates to an improvement in the construction of dampers for stovepipes, and consists in two cast iron disks, which have flat central surfaces and are interlocked so that they lie close together when united by the pivot suspension rod of the damper; they have fluted or corrugated edges, which overlap the opposite corrugations on the opposite disks, and form concave radiators above and below, so related to each other that the smoke and heated gases can enter therein from below and receive a reverse movement which deflects them against the stovepipe, thus imparting more heat to the air in a room before finally escaping.

DRESSING MILL STONES.—Notley W. Wortham, Union Point, Ga.—This invention relates to an improved mode of dressing mill stones for grinding indian corn and other grain, whereby there is a large gain in the grinding capacity of the stones over the ordinary methods of dressing the stones and a superior quality of meal is produced.

RAILROAD WEED CUTTER.—J. S. Boicourt, Boonsboro', Iowa.—This invention relates to an improvement in a device for cutting weeds on a railroad track and consists in attaching cutters either circular or straight to the truck of a car, which are worked by gear deriving its motion from the wheels of the car.

HEDGE TRIMMER AND CORN STALK CUTTER.—John W. Hull, Connersville, Ind.—This invention relates to an improvement in the construction of a machine for trimming hedges and cutting down the stalks of corn in the field, and consists in a frame mounted on wheels and drawn by a team, an adjustable rotary cutter being connected with gearing moved by one of the wheels for trimming the top and sides of a hedge and a detachable cutter being placed on the frame when required for cutting corn stalks as the machine travels.

LAMP CHIMNEY CLEANER.—George Lea, Shirleysburg, Pa.—This invention relates to the construction of an improvement for cleaning lamp chimneys, and consists in a curved metal rod having a serrated conical disk or cap on one end by which a bit of paper, cloth, or fibrous substance of any suitable kind for wiping, cleaning, and polishing a lamp chimney may be introduced.

TURNING SPOOLS, BOBBINS, ETC.—David Dick, Corning, N. Y.—This invention relates to a machine for turning spools, bobbins, and other wooden articles of a similar character, and has for its object rapidity of execution and an automatic operation of the several parts throughout,

COMBINED SHOVEL AND SIFTER.—D. Boynton, St. Johnsbury, Vt.—This invention relates to a combination of a fire shovel and sifter, and it consists in providing a shovel with a supplemental bottom in which a screen is inserted, the bottom being so arranged or disposed within the shovel as to admit of a separate discharge for the ashes, and the shovel provided with a lid or cover, all being arranged in such a manner that the ashes may be shoveled up and the cinders separated from it and the ashes discharged from the shovel so as to leave the cinders clean and in good condition to be placed upon the fire whenever required.

SPRING BED BOTTOM.—George Widdicomb, Grand Rapids, Mich.—This invention has for its object to furnish an improved bed bottom, simple in construction, very elastic and wholly without noise when in use.

PRESERVING EGGS, MEATS, ETC.—Charles Boize, New York city.—This invention consists in the use of argillite or argillaceous schist or slate finely powdered as a medium or means of packing or surrounding the eggs or other articles, whereby they are enabled to be preserved and maintained fresh and suitable for being transported from place to place without becoming deteriorated or rendered useless. The slate employed is susceptible of use over and over again and not in the least becoming deteriorated.

BELT-FASTENER AND TIGHTENER.—Charles O. Pike, North Leverett, Mass.—This invention relates to a device for fastening the ends of a belt, and for tightening it, and the improvement consists in a clamp for holding the ends of the belt together, and a lever arrangement fitted to the clamp for tightening the belt.

SEED-PLANTER.—William R. Mozier, Higginsville, Ill.—This invention has for its object the furnishing of an improved seed planter, so constructed as to furrow the ground and drop and cover the seed; and which, by removing the sub-dropping device, may be used to cultivate the crop.

INSIDE WINDOW-BLINDS.—S. W. Shorey, Galesburg, Ill.—This invention relates to a method of constructing and operating inside blinds for the windows of dwelling-houses and public buildings, and it consists in the peculiar manner in which the slats forming the blind are connected together, and the manner in which they are closed and secured in a closed position.

EXCAVATOR.—B. T. Stowell, Quincy, Ill.—This invention relates to a new method of constructing excavators and ditching machines.

SAIL SAFE.—F. G. Oehme, Plymouth, Mass.—This invention has for its object to prevent the capsizing of sail-boats, by securing the sail with an apparatus which may be set so as to release the sail when the pressure has reached the amount that the sail and boat can bear.

CULTIVATOR.—Henry Howe, Oneonta, N. Y.—This invention has for its object to improve the construction of cultivators so as to make them more convenient in operation.

EQUILIBRIUM BALANCE FOR SAFETY-VALVES.—Virgil D. Green, Watertown, Wis.—The object of this invention is to overcome the rigidity of the spring in the spring balances in common use.

WASHING-MACHINE.—Thomas Q. Frost, Indian River, N. Y.—This invention relates to a machine for cleansing or purifying linen and other clothes or

© 1868 SCIENTIFIC AMERICAN, INC.

articles of a similar nature. The invention consists in operating stampers or dashers within the washing-tub, and also in attaching to the tub rollers which are made to act as a wringer for the clothes, and which form a part of the tub.

TUG OR TRACE-FASTENER.—Ira McAllaster, Milo, Mich.—This fastener or buckle consists of a frame having side-guards, which frame is fastened in any suitable manner to the outer end of the hame-strap, along its length, so that the tug or trace-strap can be drawn through it from end to end, and there secured by inserting a tongue into the proper aperture; that is at one end of a lever arranged to slide upon a cross-pin between the side-guards and in the direction of the length of the frame, wherein such tongue is fastened by running the opposite end of the lever up over the end of the frame, where the tug or trace enters.

HAND BINDING HARVESTER.—G. H. Spaulding, Rockford, Ill.—This invention consists of a box or grain receptacle, placed on the platform into which the grain enters through the bottom, being carried therein by the action of the rolling apron, forming part of the platform. The peculiar construction of the apron conduces to the perfect working of the device.

PLOW.—Andrew Gilmore, Phœnixville, Pa.—The invention is limited to a new and improved device for preventing the colter from clogging, and in connection with this, an adjustable handle.

TABLE CUTLERY.—N. W. Caughy, Baltimore, Md.—In this invention the knife or fork is made adjustable, and extensible in the handle, so as to serve for use at both the dinner and tea table.

WATER WHEEL.—Henry W. Shipley, Portland, Oregon.—The object of this invention is to obtain a wheel which will utilize the power of small streams of water to a degree not hitherto attained.

COFFEE POT.—John Zimmerman, Royalton Centre, N. Y.—In my improved coffee pot the coffee is subjected first to the action of the stream as it rises from the water in the pot to the condenser, and afterwards to the action of the condensed water flowing back to the pot from the condenser.

POTATO DIGGER.—Thomas W. Shepard, Hennepin, Ill.—In this invention a new form of mold or plow is used, and a new arrangement for regulating it, by which greater results are obtained with less power than in any other machine for the purpose.

STEAM COOKING APPARATUS.—John Zimmerman, Royalton Centre, N. Y.—In this invention a large number of cooking vessels are so constructed that they can be arranged one above another in a vertical cylinder, and a variety of materials, vegetables, meats, pastry, cakes, etc., can be cooked at the same time in the cylinder without interfering with each other, and with a single application of the steam.

REGISTERING YARD STICK.—W. P. Lupton and C. M. Talbot, Cadiz, O.—In this invention the operator registers the number of yards measured by pressing a knob projecting from the side of the stick under his finger as he measures each yard. The number of the tally is indicated by figures appearing through a small aperture in the back of the yard stick.

AUTOMATIC STEAM VALVE FOR INJECTORS OR FEEDERS FOR STEAM BOILERS.—Richard Gornall, Baltimore, Md.—This invention is a new device designed to be applied to a steam boiler, whether connected with an engine or not, and automatically to regulate the flow of steam from the boiler to a pump or injector, the steam thus escaping being used to work the pump or injector, and feed the boiler, entirely independent of the action of an engine.

SCHOOL DESK AND SEAT.—C. Thurston Chase, Albany, N. Y.—In this invention the seats and desks are so supported that each one is connected with all before and all behind it in the row. The same construction which affects this object renders the seat much easier to enter and leave. The seats are also provided with hinged bottoms, opening upward and inward.

TIDAL OR SELF-ACTING ELEVATOR.—Philip Weck, Brooklyn, N Y.—This invention relates to a device for elevating water and other articles by the rising and falling of the tides, and is designed to be perfectly self-acting, and to effect a great saving in labor and expense in elevating articles in places where the tides ebb and flow in any material degree.

WASHING MACHINE.—G. Reneky and J. Keiss, Cedar Falls, Iowa.—This invention has for its object to furnish an improved washing machine, simple in construction, easily operated, and doing its work quickly and thoroughly.

CULTIVATOR.—C. G. Petengill, Hebron, Me.—This invention has for its object to improve the construction of cultivators so as to make them more easily adjustable, and more effective in operation.

CLEANING BOILER FLUES, ETC.—Joel M. Wheeler, Oxford, Conn.—This invention has for its object to furnish an improved means for cleaning the tubes, flues, tube boxes, etc., of steam boilers easily, conveniently, and thoroughly, which may be applied without hauling the fires, or while the ship is under way., and which cannot injure the flues, or cause them to leak.

WASHING MACHINE.—John Mitchell, Newark, Ohio.—This invention relates to an improved washing machine, and consists in the insertion of ribs in the end of the machine, between which and a vibrating weighted dasher provided with pounders alternating with said ribs, the clothes are squeezed, and effectually washed and cleansed.

CAR COUPLING.—A. Hillman, Stratford, C, W.—This invention has for its object to furnish an improved car coupling, simple, strong, and reliable in construction, not liable to get out of order, which shall be self-coupling, and which may be readily attached to an ordinary draw bar and bumper head.

HARROW.—John Aiken, Warner, N. H.—This invention has for its object to furnish an improved harrow, so constructed and arranged that it will adjust itself to pass over roots, stones, or other obstructions, without having to be raised from the ground; that it will relieve itself of rubbish, and that it may be made light, while at the same time it will do its work better than the ordinary heavy harrows.

HAY FORK.—J. S. Gochnauer, York, Pa.—This invention relates to an improvement in hay forks, in which two tines are made in one piece, two lifting toes being employed which are simultaneously operated by means of an oscillating bracing roller and a spring lever.

SORGHUM EVAPORATOR.—Noah Clouse, Buffalo Village, Pa.—This invention relates to a new sorghum evaporator, which is so arranged that the sorghum goes through the whole process in separate vessels, so that each vessel can be cleaned after it has been emptied, and can be made ready for further operation without stopping or retarding the process in the other vessels.

STEAM ENGINE GOVERNOR.—Oliver A. Kelly, Slatersville, R. I.—The object of this invention is to obviate the violent changes and consequent fluctuations in the quantity of steam admitted to the piston, and is especially designed for engines that are regulated by the main valves.

IRON SAFE.—William Gardner, New York city.—This invention consists in a novel construction of the door of a safe, which is so made as to more effectually resist the action of fire and burglars, and also in the employment of a false bottom for the purpose of conveniently and securely fixing the safe to the floor of the chamber in which it is placed, without affecting its fire and burglar proof qualities; also in an arrangement for more securely locking the door to the case or frame of the safe.

LOCK.—Jacob Wertsbaugher, La Grange, Ind.—This invention has for its object to furnish an improved lock, strong, durable, and simple in construction, which cannot be picked, and of which no impression can be taken to enable a false key to be made.

TRUNK.—Thomas Smith, Brooklyn, N. Y.—This invention relates to a new extension trunk, which is provided with a tray or trays having hinged bottoms, which tray can be secured in an inverted position upon the cover of the trunk, extending the same and forming a new compartment for packing goods. The bottom of the tray becomes in this position the cover of the trunk extension.

SEAT RISERS FOR VEHICLES.—John R. D. V. Linton, New Bedford, Mass.—This invention relates to a new kind of seat risers or seat legs now used on wagons, carriages, sleighs, and vehicles of any description. The invention consists in the use of cast metal risers in place of the ordinary wooden risers or supports, such risers, when made of cast metal, possess great and important advantages over wooden ones, in beauty, convenience, and cheapness.

SEED PLANTER.—John Stark, Thomasville, Ga.—This invention relates to a new machine for planting all kinds of seed, from the largest to the finest sorts, and for spreading pulverized manure, as well as for preparing the ground for the reception of the manure and seed and for covering the furrows made and for rolling the land.

BURIAL CASE.—Robert F. Hill, Philadelphia, Pa.—This invention relates to a new manner of constructing burial cases so that they will be strong and commodious. The invention consists in making the cover hollow, and not flat, as usual, thereby permitting the body of the case to be shallower, and the consequent better display of the face and head of a deceased person. The head can then be laid upon a pillow, so as to project above the case, and will still not come in contact with the lid when the same is closed.

CHECK REIN ATTACHMENT.—M. A. Gates, Troy, Pa.—This invention has for its object to furnish an improved check rein attachment for harness, so constructed and arranged that the horse can be unchecked or allowed to drink without its being necessary for the driver to get out of the carriage The invention consists in a strap running along the back strap of the harness guide rings attached to the back strap. To the forward end of the said strap is attached the check-rein hook, and to its rear end is attached a ring which, when the horse is checked up, is dropped over a hook attached to the rear part of the back strap or to the crupper strap. The ring of this strap is removed from the hook to allow the horse to drink and attached to it to check him up by means of a small hook attached to the but end of the whip.

LOCOMOTIVE LINK.—Thomas J. Rowley and Wm. Poland, Chillicothe, Ohio—This invention relates to an improvement in the construction of links for locomotive and other engines, and consists in a link formed of a single bar on which the box slides, which bar is stiffened by a side bar connected with the tumbling shaft.

HANGING WINDOW, SASH, DOOR, OR VENTILATING FRAMES TO CARS, ETC.—Wm. B. Dunning, Genesee, N. Y.—This invention consists in so hanging a window, door, or ventilating frame within the body of a car or other land conveyance, that it can be swung in either direction, that is either on the right or left, according to the direction in which the car, etc., is moving or as may be desired, to allow ventilaton and at the same time prevent the entrance of dust to the inside of the car.

NUTMEG GRATER.—W. W. Owen and D. C. Kelly, Muskegon, Mich.—This invention relates to a grater for grating nutmegs and similar substances, and consists of an L or T shaped pipe of tin or other metal with a spiral spring soldered at one end to a perforated grater plate which fits into the pipe; a small thumb rod is fastened to this grater and passes through the cross piece of the pipe. A grater wheel moves round on a wire axis secured to a plate borne on the pipe.

NEW PUBLICATIONS.

TODD'S YOUNG FARMER'S MANUAL, Vol. 2. How to Make Farming Pay. By S. Edwards Todd.

With full practical details of farm management, character of soils, plowing, management of grass lands, manures, farm implements, stock, drainage planting, harvesting, etc. One handsome post octavo volume, beveled boards, finely illustrated, and contains upwards of 400 pages. Post paid, $2.50

Also a new edition of TODD'S YOUNG FARMER'S MANUAL, Vol. I.: The Farm and the Workshop, with practical directions for laying out a farm, erecting buildings, fences, farm gates, selecting good farm and shop tools, and performing farm operations. Fully illustrated. One handsome post octavo volume, beveled boards, 460 pages. Post paid, $2.50.

Each volume distinct by itself, and sold separately. The experienced practical farmer will find the above works useful to him, although the author intends them more especially for the young farmer, as their titles indicate. The works are both copiously illustrated, showing improved farm tools, implements for cultivating the soil, fences, etc. The above works are both published by F. W. Woodward, at the office of the *Horticulturist*, 37 Park Row, New York.

PHOTOGRAPHIC MOSAICS. For 1868. Philadelphia: Benerman & Wilson.

This excellent little annual, by M. Cary Lea and Edward L. Wilson, is brimfull of choice extracts relating to improvements and best suggestions in photography.

THE SCHOOL DAY VISITOR.

A monthly magazine for the young, has been enlarged and improved $1.35 a year. Published in Philadelphia, Pa.

ATLANTIC MONTHLY. Boston: Ticknor & Fields.

The December number is just out. For sale by all the news venders Subscription price $4 per annum.

THE BOSTON WEEKLY ADVERTISER.

This excellent journal has entered upon a new volume—its fifty-eighth—and comes to us enlarged and improved, in quarto form, headed *The Thursday Spectator and Boston Weekly Advertiser*. We are glad to observe that prosperity and progress still attend the efforts of its proprietors.

LEAF PRINTS. By C. F. Hines. Philadelphia: Benerman & Wilson.

This is a neat little volume illustrating a very simple method of copying the forms of all kinds of leaves. The process consists substantially in making a photographic print of the leaf upon paper so prepared as to be sensitive to light. The method of preparation and printing are exceedingly simple and may be practiced by ladies. The results are very beautiful.

HISTORY OF THE MICROSCOPE.

Probably no person has contributed more towards the popularization of the microscope than Dr. Hogg, whose book bearing the above title has been ten years or more before the public. The present is a new and enlarged edition, rewritten and greatly improved. It is illustrated with some five hundred engravings explanatory of the construction of the microscope, views of the different styles manufactured, illustrations of their use, of the methods of preparing specimens, dissection, mounting, collecting, etc. Nothing could be more complete for the student or observer than the instructions of this valuable work. The wonders revealed by the microscope are both astonishing and endless. The study is most fascinating, while as an amusement for the leisure hour it is not only delightful but beneficial. If our young men and women could be induced to devote but a small portion of the time now wasted in gossip, idle conversation, or dissipation, to instructions such as may be easily realized from the microscope, they would make rapid advances in social and mental improvement. Dr. Hogg's book is probably the most popular of any upon the subject. Fifty thousand copies have been sold. The new edition is published by Routledge & Sons, 416 Broome street, N. Y.

A HISTORY OF WONDERFUL INVENTIONS. By John Timbs.

This will be found a most readable and valuable book. Every person who aspires to be well informed ought to be posted concerning the great inventions of modern times, their nature, names of the inventors, date, their progress and value. The accounts here presented concerning the early history of the mariners' compass, the barometer, the art of printing, the telescope, warfare, illuminating gas, steam engine, machine weaving, electric telegraph, and other inventions, each seem to form a separate romance of rarest interest. We wish that the facts concerning these things, their authors and projectors, could be generally fixed in the minds of young men. They could draw from them many lessons of encouragement and cheer, as showing how the men of toil in former days worked out the greatest problems of science and achieved the most extraordinary success. Beautifully illustrated. Published by Routledge & Sons, 416 Broome street, N. Y.

THE FAMILY SAVE-ALL.

This is the title of a new book relating to the economy of the kitchen, the larder, and the household generally. It contains the best recipes for cooking, from the smallest dishes up to the most difficult, with directions for the saving and reüse of very many substances that are commonly wasted. It is proverbial that people waste more than they consume. If the directions for family economy here presented were generally observed in this country, the resultant saving would be sufficient to pay off the national debt in less than five years. Price $2. Published by Peterson, Philadelphia. Sold by the New York News Company.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisemets at 50 cents a line, under the head of "Business and Personal."

☞ *All reference to back numbers should be by volume and page.*

J. B., of La., says: "I observe in your issue of Nov. 30th a notice of the presentation of a glacial theory by J. W. Reid, in which he advances the idea that the temperature of the northern hemisphere has been decreasing for 500 years. Is this correct? I thought the contrary was the case and that our winters were milder than those known to our forefathers." It is very common to hear accounts from the oldest inhabitants of the severity of winters in days gone by, but the average yearly temperature for a century past would, we doubt not, show a slight gradual decrease, and the remains of animals and plants which now flourish in tropical regions prove without doubt that the temperature of the northern hemisphere was once warmer than at present. This is not at all inconsistent with the supposition that it was also, at some time, colder than at present, for in looking into this subject we must deal with ages and not years.

J. H. B., of Pa., asks: "How many gallons of water will be required per minute to run machinery demanding 60 H. P., with an overshot wheel of 16 feet diameter? How many gallons of water will a water wheel of 60 H. P. raise per minte 40 feet high with the best pump now in use?" 75 gallons per second falling through one foot is a horse-power; that is 75x60 4,500 gallons per minute must fall through one foot for a horse-power, and this quantity falling through 16 feet will give 16 H. P. Hence for 60 H. P. 4,500x60-16ths=16,875 gallons are necessary; add to this about 35 per cent for friction. waste, etc., and you will have the required amount. As a horse-power is 33,000 lbs. raised one foot high in one minute the second query can be answered by simple calculation. Deduct from the result about 12 per cent for friction of pump, loss, etc., and the amount of water 60 H. P. will raise 40 feet high will be given.

G. W. G., of Pa., asks for a cement to secure the brass tops to carbon oil lamps. We have never found any difficulty with a cement of plaster of paris, The tops of all kerosene lamps are thus secured.

R. H., of Ohio, says, in relation to preventing scale in boilers—without injury or foaming—that the Anti-Incrustator Powder of H. N. Winans, 11 Wall street, New York city, is the most reliable article he has ever heard of and the cheapest.

Business and Personal.

The charge for insertion under this head is one dollar a line.

Parties in want of Fine Tools or Machinists' Supplies send for price list to Goodnow & Wightman, 23 Cornhill, Boston, Mass.

Pattern Letters and Figures for inventors, etc., to put on patterns for castings, are made by Knight Brothers, Seneca Falls, N. Y.

Allen & Needles, 41 South Water street, Philadelphia, Manufacturers of Allen's Patent Anti-Lamina, for removing and preventing Scale in steam boilers.

Will the Patentee or Manufacturers of Collins's Sunburner Lamp send a circular and price list of their lamps and chimneys to fit them to W. B. Beckwith, Franklin, Venango county, Pa.

Parties desirous of saving fuel, expense of cleaning, and corrosion of boilers, will find the remedy in H. N. Winans's anti-incrustation powder, 11 Wall st., N. Y.; twenty thousand references prove it reliable and uninjurious.

Manufacturers of Portable Steam Engines and Threshing Machines will will send circulars to Walker Reynolds Alpine, Talladega county, Ala.

The Safety Lamp Attachment can be applied to any Lamp. Inflammable gases banished. Lamps filled without removing the chimney. Price 25c. By mail 50c. Address Novelty Machine Co., Box 258 Troy, N. Y

Important to Capitalists.—Thos. Cooper offers for sale at a great bargain a patent mill for making railroad-car axles, which will also roll cold iron, and straighten and polish any kind of shafting. Circulars with full particulars, sent on application to Th . Cooper, Box 2377, Cincinnati, Ohio.

Wanted—Two new or second-hand steam excavators. Address, with full particulars, S. M. Barrett, Sup't S. & F. R. R., Sheboygan Wis.

Manufacturers of Fancy Glass Goods will please send their address to J. Martin, Box 316 Cairo, Ill.

J. Hexter, Vancouver, W. T., wishes to obtain a first-class turbine.

Wm. Hanser, M.D., Bartow, Jefferson county, Ga., wishes to obtain a good stump puller and a buggy plow.

EXTENSION NOTICES.

Chauncey D. Woodruff, of Toledo, Ohio, having petitioned for the extension of a patent granted to him the 7th day of March, 1854, for an improvement in suspending eaves troughs, for seven years from the expiration of said patent, which takes place on the 7th day of March, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 17th day of February next.

James H. Sweet, of Pitsburgh, Pa., having petitioned for the extension of a patent granted to him the 14th day of March, 1854, for an improvement in hanging of the griping jaw of spike machines, for seven years from the expiration of said patent, which takes place on the 14th day of March, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, th 24th day of February next.

Ellsworth D. S. Goodyear, of North Haven, Conn., having petitioned for the extension of a patent granted to him the 28th day of March, 1854, for an improvement in processes for treating india-rubber, for seven years from the expiration of said patent, which takes place on the 28th day of March, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 9th day of March next.

Henry B. Myer, of Cleveland, Ohio, having petitioned for the extension of a patent granted to him the 19th day of September, 1854, reissued the 3d day of May, 1850, and again reissued the 8th day of October, 1861, for an improvement in converting railroad car seats into beds or lounges, for seven years from the expiraton of said patent, which takes place on the 19th day of September, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 25th day of May next.

Willis Humiston, of Troy, N. Y., having petitioned for the extension of a patent granted to him the 4th day of April, 1854, and reissued the 6th day of March, 1866, for an improvement in candle mold apparatus, for seven years from the expiration of said patent, which takes place on the 4th day of April, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 16th day March next.

© 1868 SCIENTIFIC AMERICAN, INC.

BOILER EXPLOSIONS---WHAT CAN BE DONE TO PREVENT THEM.

The occurrence of several disastrous boiler explosions since we last referred to this subject, demands that we should again direct attention to this constant cause of the destruction of life and property. We have before us a large pile of letters on boiler explosions, the accumulation of several months; in these letters there is scarcely a word said about bad workmanship, bad material, improper design or carelessness or management. But the gas, electrical, and explosive compound theories are presented in nearly every conceivable way to account for these boiler catastrophes continually occurring. All these vague and useless, nay, positively injurious speculations should be discouraged in every possible way. They simply tend to distract attention from causes of a purely mechanical nature which are entirely within our control; further than this, this "mysterious agency" business is not unfrequently used by the blunderers who have built bad boilers, and employers who have hired incompetent attendants and who have used boilers which were known to be out of repair, or who have used them for long periods of time without having had them properly examined by competent persons, to shield them from the punishment which is their just due. Just as soon as the public are persuaded into belief in the opinion which is persistently urged in some quarters that boiler explosions are produced by inscrutable causes or that they are to be accounted for by some incomprehensible theory, just so soon will the time be at hand when the coroner's inquest or the victims of an explosion will be even a greater farce than it is now. And we intend to exert our influence to prevent the existence of this state of affairs which threatens us in this matter. No sooner does a boiler explosion occur than a bevy of boiler explosion theorists crawl out of their holes and either deluge the press with long-drawn theories or cunningly manage to be called as witnesses by the coroner whom they deceive by their pedantry, and in many cases prevent a proper examination into causes which, of course, tends to shield the culprits from punishment or censure.

We have no objections to, but on the contrary encourage speculation in abstract science, the nature of force and matter are fair subjects for the speculative philosopher, but when practical matters are to be examined into, common sense and analytical investigation is what is demanded, not desultory speculation.

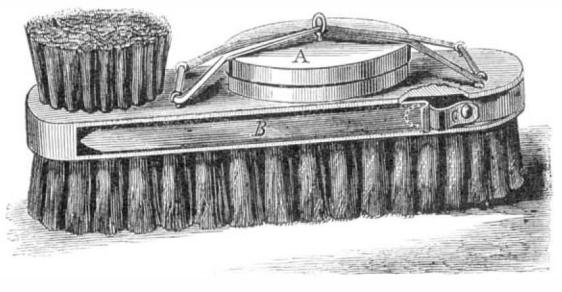
As the hydrogen gas theory is now in full blast, perhaps it may be well to devote a little attention to it and exhibit its fallacy. Hydrogen gas can only be generated in steam boilers by the decomposition of the steam or water, and it is easy to show that no such decomposition can possibly occur, to any extent worth mentioning, under any conditions arising in the use of steam boilers; and beside, if such decomposition did occur, the hydrogen so generated would have no oxygen to combine with, a condition absolutely indispensable in order that it may form an explosive compound. And still further, even if there was a sufficiency of oxygen at hand, the presence of the steam would preclude the temperature, necsssary for ignition, from being reached. Let us see what the late Professor Faraday says on this point. An apparatus having been introduced to superheat steam, by passing it through iron tubes which were placed directly in the furnace, where they could, of course, be made red hot, it was thought by some that the steam would be decomposed, that an explosive compound would be formed, and that consequently the apparatus was unsafe, and should not be used. This eminent physicist says "that as respects the decomposition of the steam by the heated iron of the tube, and the separation of hydrogen, no new danger is incurred. Under extreme circumstances the hydrogen which could be evolved would be very small in quantity—would not exert a greater expansive force than the steam—would not with steam form an explosive mixture—would not be able to burn with explosion, and probably not at all if it, with the steam, escaped through an aperture into the air, or even into the fire place. Supposing the tubes were frequently heated over much, a slow oxidation of the iron might go on within; this would be accompanied by a more rapid oxidation of the entire iron surface, and the two causes would combine to the gradual injury of the tube."

These facts thus clearly set forth effectually dispose of this "mysterious" cause, and at the same time it points out that if any portion of a boiler not covered with water is exposed to a high temperature from the furnaces slow oxidation of the iron is likely to go on, and then the boiler in that part may gradually become deteriorated or decayed until it can no longer stand the pressure on that part, and away it will go. But this is certainly a cause which can be prevented by proper vigilance, the part repaired, and if necessary protected from the action of the fire. And this leads us to consider the fact that if a boiler is so planned that proper circulation of the water over the heating surfaces is prevented, those parts in direct contact with the hottest part of the fire, are liable to be exposed to its action, while, instead of being covered with water, they are simply enveloped in a layer of steam, which not only is a bad conductor of heat and consequently permits the metal to be overheated, but also allows it to be deteriorated by oxidation. This state of affairs can and has existed in boilers whose gage cocks showed an ample supply of water. Hence those boilers which do not allow for an unobstructed departure of the steam bubbles from the heating surfaces, and for a circulation that will always keep those surfaces in contact with solid water are positively dangerous and should not be permitted to be used. We might mention several cases in our experience which bear on this point and conclusively show the great danger which may be incurred from this cause, but want of space warns us that we must proceed to the point it is our desire to impress upon our readers, and that is that boiler explosions with their appalling consequences are becoming so very frequent that practical measures are at once demanded, to at least diminish their frequency, if indeed they cannot be wholly prevented. We need scarcely remark that the first step which should be taken in this direction is to remove those causes, which it is known do produce the horrible disasters which makes one shudder to think of, and which are almost daily to be seen in the papers. These causes, we again repeat, to be bad workmanship, bad planning, incompetent attendance, deterioration, bad iron, and inoperative safety valves. We think that all of our readers will agree with us that these fruitful causes are almost wholly within our control. Legislative action we do not believe can wholly remove them, bad planning, bad workmanship and bad iron it certainly cannot, but we believe that much good may be effected by the passage of a law with respect to the competency of those who are to be allowed to have charge of steam boilers, and by providing for rigid periodical inspection prevent much of the danger from deterioration or corrosion, and we are sure that a law compelling the use of proper lock up safety valves on stationary boilers cannot fail to add to the security of the public.

But after all, let our legislation do their best, and pass the most perfect laws on this subject that can be enacted, yet we are confidently of the opinion that much more good is to be accomplished by Boiler Insurance Associations. In this, that important element, self interest, is made to act in a much more powerful manner than can be brought about by any system of legal inspection, no matter how rigid its provisions may be, or how carefully it is drawn up. The self interest of a corporation will be sure to discover flaws and causes of danger which will escape the less interested inspection of a paid official.

PARET'S IMPROVED BLACKING BRUSH.

A combination of brush, blacking, and mud scraper, forming a very compact and handy contrivance for household or

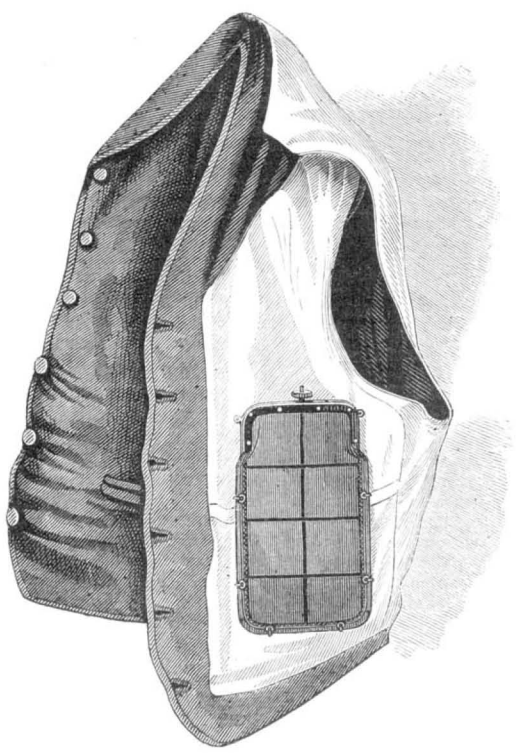


traveling use is presented in the accompanying engraving. A few words will explain its construction. The blacking box, A, is held in place, when not in use, by an endless elastic band, secured by hooks, which, being open at the shanks, permit the replacement of a new elastic for a worn out one. In a recess, in the side of the brush, slides a metal scraper, B, held in place by the spring, C. Thus we have combined, all the appliances for cleaning and polishing boots and shoes in a simple and compact form.

Patented through the Scientific American Patent Agency, Nov. 12, 1867, by Charles A. Paret, of 43 Union street, Nashville, Tenn. The patentee desires to dispose of the entire right, or to make arrangements for manufacturing on a royalty. Those interested will address as above.

YANKEE SAFETY POCKET.

The art of the pickpocket is successful not only because of the dexterity of its practitioners, but also because the preventives used are not usually effectual. A pocket, to be se-



cure against the depredations of the light fingered, should not only be locked, but composed of such material as cannot be readily cut. Such are the characteristics of that shown in the accompanying engraving, which represents it as attached to the inside of a vest. The outside of the pocket is of leather, similarly lined, having between the two a network of steel, impenetrable by the knife of the operator. The top is a clasp resembling those used on porte monnaies, with the difference that the knob, by pressing which it is opened, is movable, the piston or stem being a screw on which the button turns; when down on the face of the jaws it cannot be depressed to operate the spring catch, while a few turns will raise it on the spindle or stem so that the pocket may be opened. A series of metallic eyelets around the edge of the pocket afford a ready means of attaching it to the garment, whether vest, coat, pants, or a lady's dress.

This device was patented Oct. 24, 1865, by T. S. Lamborn, who desires to dispose of territorial rights, and may be addressed at Marshallton, Pa. [See advertisement on another page.]

New Locomotive for Common Roads.

Mr. R. W. Thomson, C. E., Edinburgh, has invented and patented a new locomotive for common roads, which was lately tried in the neighborhood of Edinburgh.

The tires are made of bands of vulcanized india-rubber, about twelve inches wide and five inches thick. Incredible as it may appear, this soft and elastic substance not only carries the great weight of the road steamer without injury, but it passes over newly broken road metal, broken flints, and all kinds of sharp things without leaving even a mark on the india-rubber. The tires do not sink into the road in the least degree. They pass over stones lying on the surface without crushing them.

The india-rubber tires require scarcely any more power to propel them over soft bad roads or over loose gravel roads than on the best paved streets. The reason of this is quite obvious; they do not sink into roads, and do not grind down the stones in the least degree.

On Monday, the trials commenced by running the road steamer across a soft grass field, and it was afterward taken across a part of the field which had just been covered with loose earth to the depth of one or two feet, and run straight across, and then back through the deep soft soil. The weight of the road steamer is between four and five tuns; and yet the wheels, in passing over the loose earth, compressed it so little that a walking-stick could easily be pushed down in the track of the wheels without any exertion. After various evolutions, showing the ability of the road steamer to run about where there were no roads, it passed out into the street, and, taking a large omnibus full of passengers in tow, it proceeded up the Bonnington road to Messrs. Gibson and Walker's mills, where it took a large wagon, weighing, with its load of flour, about ten tuns, up a steep lane full of holes and ruts, and rising with a gradient of one in twenty. It was obvious that the road steamer was able to do a great deal more than it had to do in this trial. The bite on the road is something marvellous, and the easy way in which it floated along on its soft and elastic tires was very curious. When riding on the road steamer, the feeling is like what would be experienced in driving over a smooth soft grass lawn. There is, absolutely, no jarring at all. There was no appearance of wear on the india-rubber tires. The original surface which the rubber had when it left the manufactory is still visible. The engine is destined for Java, where it will be employed in drawing trains of wagons between two ports. The steamer, which was the subject of the experiments, had another specialty besides the wheels, it being fitted with one of Mr Thomson's patent vertical boilers.—*Engineering.*

Experiment on the Formation of Aniline Colors.

Pour into an ordinary test tube one fluid dram of pure concentrated sulphuric acid and add to the same one-tenth to three-tenths fluid dram of a diluted solution of sulphate of aniline. When, now, the solutions of different oxydizing agents, as those of chlorate or nitrate of potassa, hypochlorite of soda, chromic acid, bichromate of potassa, iodic acid, peroxide of hydrogen, or others, are allowed to flow upon the mixture of the tube, a characteristic coloration ensues at the place where the two fluids come in contact, in shaking the same is communicated to the whole liquid. Hypochloric acid or its respective salts produce a beautiful blue, nitric acid or its salts a rich carmoisin, chromic acid a bright violet. The nuances vary according to the strength of the liquids, and as there are but traces sufficient to produce a certain color, reactions may be founded upon them for the recognition of said oxydizing agents.

Preservation of Photographs.

H. Cooper, Jr., of England, gives the following formula for a preservative varnish which is stated to be an entire protection against fading :—

1 dram of gum dammar dissolved in one ounce of benzole.

1 dram of paraffin, dissolved in one ounce of benzole.

Mix four parts of the paraffin solution with one part of the dammar solution.

Prints covered with this varnish are impermeable to water. A solution of the paraffin only will do; but is better with the gum dammar.

THE ARAB JUGGLERS.—Mr. Frank Buckland gives in *Land and Water* the result of his observations of these performers. The snakes they handle are not poisonous, but belong to a harmless species common in France and England. The man who thrusts skewers through his tongue and the back of his neck has permanent holes for their introduction, and does not suffer more pain than when a lady puts on her earrings after leaving them off for some time. Other features of the exhibition remain unexplained. Mr. Buckland concludes "Altogether, I do not recollect having seen an exhibition which combines so many horrible and truly sensational sights in so short a space of time."

© 1868 SCIENTIFIC AMERICAN, INC.

Scientific American.

MUNN & COMPANY, Editors and Proprietors.

PUBLISHED WEEKLY AT
NO. 37 PARK ROW (PARK BUILDING), NEW YORK.

O. D. MUNN. S. H. WALES. A. E. BEACH.

☞ "The American News Company," Agents, 121 Nassau street, New York
☞ "The New York News Company," 8 Spruce street.
☞ Messrs. Sampson Low, Son & Co., Booksellers, 47 Ludgate Hill, London, England, are the Agents to receive European subscriptions or advertisements for the SCIENTIFIC AMERICAN. Orders sent to them will be promptly attended to.
☞ Messrs. Trubner & Co., 60 Paternoster Row London, are also Agents for the SCIENTIFIC AMERICAN.

VOL. XVIII., No. 1....[NEW SERIES.].... *Twenty-third Year.*

NEW YORK, SATURDAY, JANUARY 4, 1868.

Contents:

(Illustrated articles are marked with an asterisk.)

*Improvement in Setting Blocks for Saw Mills	1	The Dignity of Labor	5
Important Patent Suit	1	Editorial Summary	5
*Barley's Cane Stripping and Pruning Knife Combined	1	Manufacturing, Mining, and Railroad Items	6
Passenger Travel on British Railways	1	Recent American and Foreign Patents	6
Omnibus Subways	2	New Publications	7
On Snow, Rain, and Hail, in their Relations to the Atmosphere	2	Answers to Correspondents	7
The Hoosac Tunnel Drills	2	Extension Notices	7
Replies to Questions on the Day Line	3	Boiler Explosions—What Can Be Done to Prevent Them	8
Heat Without Coal—Utilization of Wind Power	3	*Paret's Improved Blacking Brush	8
The Cold Cave at Decorah	3	*Yankee Safety Pocket	8
*Solution of Plane Triangles	3	New Locomative for Common Roads	8
Removal of Obstructions in the Mississippi at Rock Island	3	Experiment on the Formation of Aniline Colors	8
Momentum and Inertia	3	Preservation of Photographs	8
Aluminum for Mathematical Instruments—Folding Machine	3	Encouraging Prospects	9
Extermination of Cockroaches	4	Stereotyping with Paper	9
Naphthalin and its Use	4	Mining Education—Governmental Mining Schools	9
On the Formation of the Diamond	4	Our Iron Deposits	9
A Daring Explorer	4	Illuminated Time Calendar for 1868	9
*Skating Rink	5	Patent Claims 10, 11, 12, 13,	14
		Pending Applications for Reissues	14

ENCOURAGING PROSPECTS.

In our last issue we stated that it was our desire to increase the circulation of the SCIENTIFIC AMERICAN from thirty-five thousand to fifty thousand on the new volume. We are encouraged from the prompt manner in which our old patrons are renewing their subscriptions, and the large clubs of new names our good friends are sending in, that our ambition to increase the weekly circulation to fifty thousand will be early accomplished.

STEREOTYPING WITH PAPER.

This is now in common use in all the principal daily newspaper establishments in New York. It is conducted substantially as follows: The stereotyper first dries the form of types upon an iron steam table. The form is then partially unlocked and a hand brush is rubbed over the surface of the types, cleansing them preparatory to placing over the entire form a sheet or sheets of thin bank note paper, of the finest quality, previously wetted to insure the required pliability. This paper being evenly laid over the types, the workman takes a long-handled brush made of short, stiff bristles. with which he beats the wet paper evenly, forcing it into all the depressions of the types, taking care not to break the paper. This work finished, a dampened sheet of thicker but more ordinary paper is placed over the first. This is also brush-hammered down upon the types, and followed by another sheet of paper, thinly coated with a preparation of whiting and starch. Again the brush is used to beat this home, after which a brown paper backing is put on, and then the form of types, covered by the before-mentioned sheets of paper, is trundled to another steam table, where it is slid under a powerful screw press, several blankets folded over it, and all firmly held down until the paper matrix is dry-hardened, or "cooked," as the workmen express it. The papering process occupies three or four minutes, the cooking about twice as many. The matrix is now peeled off from the form and prepared for casting, by sifting it with finely powdered borax, which with a soft brush is thoroughly rubbed into the sunken surface left by the types. The surplus borax having been removed, the matrix (which now resembles hard but pliable pasteboard) is ready for the casting box, which is made of iron, either straight or curved, to suit the press bed. Handle irons hold the matrix in its proper place, at the exact distance (about half an inch) necessary for the thickness of the stereotype plate, which is made by pouring a quantity of hot type metal into an open end of the casting box. This metal, dropping between one surface of the casting box and the sunken surface of the matrix, fills up the latter without burning it. A few moments are allowed for cooling, and then the matrix is stripped from the warm plate, which is subsequently prepared for the press, by trimming down all thick lines, or chiseling away any superfluous metal, paring off the edges, filing, and otherwise treating the stereotype after the usual manner. Circular saws driven by steam power, and hand cutting machinery of various kinds are used in finishing, the whole operation of stereotyping occupying from fifteen to twenty minutes. A second plate may be obtained from the original matrix, in about two minutes, and almost any number of castings can be taken by careful workmen. In some offices only one mold is taken, this being used for casting the number of plates required for several presses. The stereotype, being an exact reproduction, in solid plate form, of the million or more types originally put together by the compositors, is fastened upon the Hoe, Bullock, or any other printing press, and used in place of the types. The advantage of duplicating the plates is apparent. Two or ten presses, working similar plates, will print off in a couple of hours an edition of twenty or a hundred thousand copies, which formely occupied so much more time that when ten or twelve-cylinder "fast" presses became "slow," second and third editions were resorted to by editors desirous of giving the public the latest news. Previous to the use of stereotypes for newspaper purposes, duplicate forms were sometimes "set up" in type, an extra expense to the office adopting this course which was incurred only whenever a pressure of important news was likely to prevent the forms going to a single press in season for working off the edition. Compositors can now work until three and four o'clock in the morning, and half an hour later half a dozen "duplicates" of their work may be seen on as many different presses, striking off the printed sheets, units of an immense edition of perhaps seventy-five or eighty thousand copies of some newspaper, all of which are frequently counted and delivered to the carriers and newsmen before the editors, compositors, or stereotypers can reach their homes and retire to rest.

MINING EDUCATION---GOVERNMENTAL MINING SCHOOLS.

No department of industry in this country has received such an impetus, or been so largely developed within the past twenty years, as the mining of metals. Especially is this statement applicable to the production of the precious metals. Their mining and separation has become one of the most important departments of our national industry. From this source more than from any other, perhaps, is derived the bullion upon which the government relies to redeem its promises. Yet, with all the developments of new mines, the increase of the number of men engaged in the business, and the improvements made in reducing machinery and appliances, it is believed that the amount of the precious metals derived are wholly inadequate to the means, whether of labor, capital, or material, employed. Not only so, but the actual production is gradually declining. Surface workings, however rich, and however easily made profitable, are soon exhausted, and then the labor of human hands must be superseded by the power of machinery and the agency of chemical science.

And it is in these respects that the failure to increase the total yield of our gold and silver fields is most perceptible It is confidently asserted that our imperfect systems of reduction entail a loss of at least twenty-five per cent, probably more. On the Comstock lode, a return of sixty-five per cent of the silver contained in the ore is considered very fair. The yield of this lode for the past year is estimated at $17,000,000. A loss of thirty-five per cent amounts to more than $9,000,000.

We have received several communications on this subject, from practical men acquainted with the facts, all of whom attribute this waste entirely to a lack of scientific knowledge of the quality of the ores, the best methods and materials for their reduction, and to the want of proper machinery. To remedy this undesirable state of affairs, practical education is necessary, and the establishment of governmental schools for instruction in the treatment of ores is advocated. At present our skilled managers are mostly foreigners; those Americans who are engaged in mining, and possess a scientific knowledge of the business, having gained it in foreign schools. Mr. J. Ross Browne, in a pamphlet just received, proposes the establishment of a national school, for practical and scientific instruction in the reduction of ores, at some convenient locality in our gold and silver producing regions. That such a school, properly managed, is to be desired by every consideration of national advantage cannot be denied; but we cannot see the necessity of its being established or supported by the national government, any further than an appropriation of money or lands could be considered as an aid. Instruction in the science of the mining art is already adopted as a branch of study by several of our educational institutions. Yale, Harvard, Columbia, and other colleges have departments devoted to this branch, and others will undoubtedly follow their example. Neither do we see the necessity of locating such an institution as that proposed in a mining region. Assays of ores and their chemical treatment can as well be made and accomplished in New York city, or anywhere else, as in Colorado, California, Montana, or Arizona, and certainly the locations should be chosen with a view to the benefit of the greatest number. Governmental patronage and interference in our industrial pursuits seldom have produced satisfactory results. An endowment by government may be very well, but the institution should be managed by the associated effort of those directly interested.

A correspondent from Denver, Colorado, advocates similar schools, to be established and conducted by the legislatures of the states or territories. A bill for a school, he informs us, has been passed by the legislature of Colorado. This writer believes the institution will be self-sustaining from the income of donated property, tuition fees, the labor of students, assaying, ores presented for analysis, the proceeds of its own mines kept continually at work, and the preparation of plans, etc., for the construction of works. We confess we do not share in the sanguineness of our correspondent's belief. He expects the school to be in some respects an incorporated company. owning, controlling, and working its own mines. Such an institution, under the patronage and direction of a state legislature, would become, in all probability, a source of corruption, and its objects removed from the domain of science to the arena of politics. We see no more reason for establishing governmental schools for teaching mining than for teaching farming.

Doubtless, however, the facilities for procuring a thorough scientific and practical knowledge of the metals and their reduction from their ores should be increased, and that, we think, can be done without placing such institutions under the control of the government or locating them exclusively in mining regions. The remedy for the want of truly scientific knowledge on this subject is to be found in the exertions of individuals and companies directly interested in mining, rather than in appeals to the government either of a state or the nation.

Our Iron Deposits.

Iron ores of nearly every species and variety are distributed profusely over the whole country, and among them are species which belong to North America alone. Native iron—to commence with the simplest ore in which iron occurs—has only been met with in Canaan, Conn., in a vein or plate of two inches thickness, and is rather a mere curiosity. The ore, however, most generally distributed over the country is that of the mineralogical term limonite; it comprises a great number of varieties of all shades of color and the most varying forms, as the brown and yellow hematite, the pipe and bog ores. They are nearly all very well qualified for the manufacture of pig metal, and contain in their pure condition 59.15 lbs. of iron in 100 lbs. of ore. Vast beds of this ore are near Salisbury and Kent in Connecticut. Similar deposits are in the State of New York; it occurs in Massachusetts, Vermont, Maryland, and Ohio. The whole iron business of Hanging Rock depends upon it. Kentucky, Tennessee, and Alabama abound in inexhaustible beds of the best quality, but Pennsylvania is favored with the richest varieties of this mineral. It is there found in the anthracite region and in the valleys of the western coal formation. The kind of ore particularly adapted for the production of heavy wrought iron, yielding a most tenacious metal, is the red iron ore. If pure, it may contain about 70 per cent of iron, but when associated with clay, or silicious matter, it often does not yield more than 10 to 12 per cent of it. Specular iron and iron glance are varieties of this ore, the former being the kind from which the damask of Persia and the wootz of India are manufactured. In the United States it is, however, not yet found in any amount worth noticing, but other varieties are found throughout the Union. Heavy beds of the red variety occur in Wisconsin and Michigan; other but inferior varieties are largely met with in Missouri, New York, New Jersey, Pennsylvania and Arkansas.

MAGNETIC IRON ORE, LOADSTONE.—The richest kinds of this ore, as that occurring on the west side of Lake Champlain, contain 70 per cent of metallic iron; other varieties—conglomerates—do not yield more than 20 to 25 per cent. of the metal. Large and valuable beds of magnetic iron are found in Essex county, New Jersey, Pennsylvania, New York, and Ohio. The iron mountains of Missouri also appear to belong to this species. It forms the main body of iron ore in Sweden.

THE CARBONATE OF IRON.—This species comprises two varieties: the spathic, or sparry iron, and the compact carbonate, which has no relation externally with the sparry variety. The compact carbonate is largely distributed over the United States; its finest quality is found near Baltimore. We also find it in the Foostburg coal region, in Maryland, and in almost all the western coal deposits along the Alleghany and Ohio rivers. It generally does not contain more than 20 to 33 per cent of metallic ore, but is little used, on account of its being of rather difficult treatment in preparing it for smelting. The same is the case with the sparry or spathic variety, which almost in all instances, where it occurs, is adulterated with sulphur, and in some cases with copper. Large quantities of this ore are found in Vermont, Connecticut, and New York; smaller veins occur in all the New England States, in New Jersey, Pennsylvania, Virginia, North Carolina, and the States around the Lakes. In North Carolina it forms the bulk of a vein of gold ore, and it besides this associates with nearly all kinds of metallic ores, changing the character of a vein from one kind of an ore to another.

The Franklinite or dodecahedral iron ore is composed of 66.00 parts of peroxide of iron, 16.00 parts of oxide of manganese, and 17.00 parts of zinc, being a species which belongs to North America alone. It is, in association with the red zinc ore, found in large veins and masses near Franklin furnace, in Hamburg, N. J., and at Sterling, in the same vicinity, and is a most important ore, particularly for the manufacture of crushers and mills. The mixed ore of Franklinite and red zinc has been successfully worked for metallic zinc.

Illuminated Time Calendar for 1868.

Subscribers to the SCIENTIFIC AMERICAN who would like a copy of our handsomely Illuminated Calendar for 1868, can have copies mailed to them free on sending their address to this office.

PROPOSED OVERLAND ROUTE THROUGH BRITISH AMERICA.—Mr. Waddington, a person of note in British Columbia, has sailed for England to advocate a pet scheme of his which is the construction of a railroad through British America connecting the Atlantic and Pacific oceans, The journey across this part of the continent has been undertaken by only few adventurers, and to this day a package of merchandise or mail bag has never passed direct from Canada to British Columbia. From a pamphlet Mr. Waddington has published it appears that by making use of the lakes and rivers on the line 2,400 miles of steam navigation can be introduced. The railroads now in running order at the East are 1,285 miles more making necessary only the building of 648 miles of road more. When the line is completed the time to be occupied in traversing the entire 4,333 miles from ocean to ocean will not exceed twenty to twenty-three days.

ADVERTISERS are referred to the new rates for advertising as announced in the first column of advertising page.

© 1868 SCIENTIFIC AMERICAN, INC.

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING DECEMBER 17, 1867.

Reported Officially for the Scientific American

PATENTS ARE GRANTED FOR SEVENTEEN YEARS the following being a schedule of fees:—

On filing each Caveat.....$10
On filing each application for a Patent, except for a design.....$15
On issuing each original Patent.....$20
On appeal to Commissioner of Patents.....$20
On application for Reissue.....$30
On application for Extension of Patent.....$50
On granting the Extension.....$50
On filing a Disclaimer.....$10
On filing application for Design (three and a half years).....$10
On filing application for Design (seven years).....$15
On filing application for Design (fourteen years).....$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

☞ *Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to Inventors, may be had gratis by addressing MUNN & CO., Publishers of the Scientific American, New York.*

72,152.—BOLT MAKING MACHINE.—Abram Alexander, Pittsburg, Pa.

I claim the combination of the piece, D, guides, d d, and frame, A, with the pieces, H H, bolts, G G, and gripping dies, J J', guides, G' G' G' G', arranged and operating substantially in the manner and for the purpose set forth.

The compound cam, F, and block, F', in combination with the drop piece, D, to obtain a vertical upward motion of said piece, D, in the manner specified and for the purpose stated.

The hollow screw, 1, bolt, 3, and nut, 18, in combination with the hammer f, or its equivalent, and the gripping dies of a bolt making machine, substantially in the manner and for the purpose specified.

72,153.—MACHINE FOR MAKING BOLTS.—Abram Alexander, Pittsburg, Pa.

I claim the combination and arrangement of the cam, C, levers, G and M, bar, D, and pin, T, with the weight, W, or a spring, acting substantially in the same manner, when used and applied to operate the gripping dies closing machinery described in my improved bolt making machine, or any other substantially the same.

72,154.—CHURN DASHER.—Andrew E. Banks, Detroit, Mich.

I claim, 1st, The use of the dowel pins, B B B B, for the purpose described, when arranged substantially as set forth.

2d, The combination of the disks A A, etc., with holes through them, F F, etc., the upper disk or collar, G, with the hollow handle, C, provided with the valve, E, and the dowel pins, B B, etc., when arranged substantially as described and for the purpose designed.

72,155.—SAW MILL.—Ashbel P. Barlow, Claremont, N. H.

I claim, 1st, The ways or guides, b, constructed with the double inclines and parallel sides, substantially as shown and described.

2d, The cross head, cut away as shown at s, and provided with the lips having the convex faces, r r, constructed and operating substantially as and for the purpose set forth.

3d, The saw buckle perforated and slotted as described, in combination with the gib or key bolts, o, as set forth.

4th, The hollow pitman, slotted at m, and provided with adjusting keys for varying the distance of the saw pivot from the pitman fulcrum, in the manner and for the purpose set forth.

72,156.—DEVICE FOR ACCUMULATING POWER.—George H. Becker (assignor to himself and John C. Lanier), Memphis, Tenn.

I claim the construction and combination of the levers, E G J M O R and X, with the pitmen, D H L P and U, the connecting arm, T, and the wheel, W, and weight, Y, when arranged as herein described and for the purpose set forth.

72,157.—DRYING AND SEASONING LUMBER.—E. C. Bender, York, and Wm. Steffe, Philadelphia, Pa.

We claim the within described process of seasoning lumber, consisting in subjecting the lumber to the action of a gradually increased temperature, in an air tight chamber, until all or nearly all the moisture has been extracted from it; in retaining all the heat and watery vapor about the lumber until a temperature of about 170° Fah. has been attained in said air-tight chamber; and, finally, in compelling the heated moistened air to escape slowly from said chamber, while the temperature is reduced therein substantially in the manner herein set forth.

72,158.—PRESERVING EGGS AND OTHER SUBSTANCES.—Chas. Boize, New York city, assignor to himself and Peter M. Devos.

I claim the use of argillite, substantially as and for the purpose described.

72,159.—PLUMB AND LEVEL.—S. A. Bostwick, Laconia, N. H.

I claim the semicircular spirit block, B, fitting and adjusting in the semicircular space in the stock, A, arranged and operating substantially as and for the purpose herein specified.

Also the grooves, g and i, and stops, h and l, combined and arranged substantially as and for the purpose set forth.

72,160.—SHOVEL AND SIFTER.—D. Boynton, St. Johnsbury, Vt., assignor to himself, H. G. O. Burrows, and Arthur E. Whitney.

I claim a fire shovel, A, provided with a supplemental bottom, e, containing a screen, f, and also provided with a cover or lid, B, all arranged in the manner substantially as and for the purpose set forth.

72,161.—MACHINE FOR SEPARATING ROOTS FROM PEAT.—Sewall Brackett, Jamaica Plain, Mass.

I claim the combination and arrangement of the carriage, B, the main and supplementary grates, D G, the series of pins, e, mechanism for raising the supplementary grate on the pins and mechanism for imparting to the main and supplementary grates reciprocating longitudinal movements as set forth, these mechanisms being the lever, f, the bar, H, and the uprights, f, and the crank shaft, E, and connecting rod, F.

I also claim the combination and arrangement of the whole and the peat receiver, A, as set forth, the said peat receiver and the carriage, B, being connected by means substantially as explained.

72,162.—MANUFACTURE OF STEEL.—James R. Bradley and Moses D. Brown, Chicago, Ill.

We claim the improved processes for making steel of different kinds herein described, by mixing the several ingredients in the proportions, and melting the same with malleable or scrap iron, as specified.

72,163.—HARVESTER RAKE.—Isaac P. Cadman (assignor to himself and James Aiken), Mendota, Ill.

I claim so combining a circular reciprocating rake with the cam wheel which gives it its rising and falling motion as that the rake shall move said wheel when it clears the platform, and without it when it returns for the next sweeping or clearing operation, substantially as described.

I also claim, in combination with the sweep rake, the pivoted holding arm, 4, acting in conjunction with it, as and for the purpose described.

72,164.—DEVICE FOR ATTACHING OVERSOLES TO BOOTS AND SHOES.—B. H. Camp, Washington, D. C., assignor to himself and Rufus Prentice.

I claim in combination with the oversole, a, the corrugated elastic clasp, b, when constructed, arranged and operating in the manner herein described.

72,165.—HYDRAULIC ELEVATOR.—Thomas Chambers, St. Louis, Mo.

I claim, 1st, The reservoir, A2, the car, B, the chamber, B1, the pump, D, and the pipes, D1 and D2, when combined and arranged as described and set forth.

2d, The indicator, c c1 c2 c3 c4, when arranged in relation to the dumb waiter as described.

3d, The brake attachment, L l L', when constructed and arranged in relation to the elevator as described and set forth.

4th, The self-tipping and unloading shelf, b5, when combined with the elevating car, as described and set forth.

72,166.—PADLOCK.—Charles J. Clements, New York city.

I claim the guard plate, B, arranged and operating in combination with the tumblers, a a, substantially as and for the purpose herein specified.

72,167.—MECHANISM FOR CONNECTING A HORSE WITH A CARRIAGE.—Alvin Colburn, Lynn, and Elbridge G. Stanley, Fitchburg, assignors to Alvin Colburn and John Raddin, Lynn, Mass

We claim the arrangement of the connecting bar-case, B, with its bar, C, and spring against the side instead of on the end of the shaft, the same rendering no reduction of the shaft necessary in the application of the invention thereto.

Also the combination and arrangement of the spring bolt with the socket piece and the bar, C, its case and spring, arranged with the shaft as set forth.

Also the combination of the double eye piece, F', having a tooth, as described, with its spring bolt, its case and socket piece, to be used with the slide bar, C, made and applied, or to be applied to a shaft substantially as described.

72,168.—LUBRICATING CUP.—J. B. Collin [assignor to himself and R. E. Ricker], Altoona, Pa.

I claim an oil cup having an adjustable tapering pin projecting theough, but free from contact with the sides of an orifice communicating with and smaller than the discharge passage, x, so as to form a regulating drip or guide for conveying the oil from the cup to the said passage, all substantially as described.

72,169.—WATER WHEEL.—Gilbert M. Conner, Cohoes, N. Y.

I claim, 1st, The combination of the circular receiving chamber and the helical floor, or its equivalent, with the radial guide chutes, substantially as described.

2d, The combination of the central hub, and its inclined and twisted buckets, with the conical wheel case, all constructed and operating substantially as described.

3d, The combination of the deflecting floats with the controlling rim, for the purpose specified, arranged and operating substantially as described.

72,170.—BOAT LOWERING APPARATUS.—Robert Creuzbaur, New York city.

I claim, 1st, Davits which are hinged in such manner as to swing freely in vertical or nearly vertical planes toward and from the water, and to vibrate above and below a horizontal plane intersecting their axes of motion, substantially as described.

2d, The application of curved sections to the upper ends of davits which are hinged at their lower ends, so that said sections can be turned around independently of the standards or lower sections of the davits, substantially as described.

3d, The application of a ladder to a davit, operating substantially as described.

4th, The combination of a folding hand rail and ladder to a hinged davit, operating substantially as described.

5th, Boats' davits hinged substantially as described, when counterpoised by a force sufficient to raise them without the boat, but easily overcome by the weight of the boat.

72,171.—BOAT LOWERING APPARATUS.—Robert Creuzbaur, New York city.

I claim, 1st, The application of elastic cushions, t' t', between the hand-wheel hub, Q, and the ratchet wheel, U, for the purpose and in the manner substantially as described.

2d, The longitudinally traveling drums, K, applied to the shaft, L, substantially in the manner and for the purposes described.

3d, In combination with the pivoted ships' davits, the pivoted shield or guard, S, constructed so as to keep the ropes, R, in place upon their pulleys during the raising and lowering of a boat, substantially as described.

4th, The combination of elastic pressure roller, h1, with the roller or pulley h, for preventing the slack of rope, R, from extending back to its drum, K, substantially as described.

72,172.—BOAT DETACHING APPARATUS.—Robert Creuzbaur, New York city.

I claim, 1st, Spring bolts, d d, or their equivalents, constructed as described, and applied to sheaths, so as to catch and hold the suspension tongues, C C, when thrust into said sheath, substantially as described.

2d, The employment of eccentrics or cams, b b, in combination with the rods, c c, and spring bolts, d d, substantially as described.

3d, The feathered coupling tongues, C, in combination with grooved and flaring sheaths, substantially as described.

4th, The attachment of the coupling tongues to springs or spring boxes, substantially as described.

72,173.—CORN POPPER.—Daniel A. Denison, Troy, Mich.

I claim the arrangement and combination of the wire cloth pan, A, with the pieces of strap iron, B B, and the tin pan or cover, D, all arranged substantially as described for the purpose designed.

72,174.—STICK FOR TRUNDLING HOOPS.—Agnes Doisy, Cincinnati, Ohio.

I claim the improved hoop stick, B, provided with an elastic strap, tape, or cord, D, fastened by one end to the stick B, and being susceptible of being hooked or fastened by the other end to the said stick, in the manner and for the purpose set forth.

72,175.—WASHING MACHINE.—H. C. Dorman, North Bridgewater, Mass.

I claim, 1st, The combination and arrangement of the wheels, W W', the tub, S, the knob, K, with the springs, H H', substantially as described and for the purpose set forth.

2d, The holding disk, T, when slotted at V V', in combination with the reciprocating tub, S, substantially as described and for the purpose set forth.

72,176.—FIRE-PROOF SAFE.—Ebenezer D. Draper, Hopedale, and Edward W. Glover, Medford, Mass.

We claim the concave cap, c, in combination with the case, A, and the fusible metal sealing or solder, d, of the kind described, such cap being arranged with the mouth of the case in the manner as set forth.

72,177.—DEVICE FOR SECURING AND FEEDING SOFT CRABS.—Constantin Drexler, Washington, D. C.

I claim a marine inclosure constructed and arranged as shown, and provided with the guards or fenders, f, and the movable floats, g g h h, or their equivalents, forming artificial hiding places, arranged as shown and for the purposes substantially as described.

72,178.—ROCKER FOR CHAIR OR CRADLE.—Chas. S. Dunback, Swampscot, Mass.

I claim the arrangement of the guard or cushion, B, against or about the end of the rocker, in manner and for the purpose specified, meaning also to claim as an improved manufacture a rocker as made with an elastic cushion applied to its rear end, as set forth.

72,179.—STOVE BACK PLATE.—Giles F. Filley, St. Louis, Mo.

I claim the method of forming the draught flue projection in the back plate of stoves with a curvature, in the manner substantially as shown and specified.

72,180.—SEWING MACHINE.—William Fiske, Lowell, Mass.

I claim, 1st, The combination of a sewing machine with a movable table, by means of cord, H, and pulley, I, and shaft, F, worm and worm gears on shafts, E and F, and cord, J J, with shaft, C, substantially as herein set forth and described.

2d, The band, P, on pulleys, R and Q, with tightener, Q2, fig. 1, for transmitting power from shaft, E, to shaft, O, substantially as set forth and for the purpose described.

3d, Also the shipper, M, tightener, N, belt, D, shafts, E F, and cord, H, for the purpose herein set forth.

4th, Also the brake, S, on shipper, M2, in connection with detent, T, and balance wheel, U, as fully set forth and for the purposes described.

72,181.—MACHINE BELTING.—Vincent Fountain, Jr., Castleton, N. Y.

I claim forming machine belting by combining leather with metal riveted thereto, as herein described.

72,182.—ORE CONCENTRATOR AND AMALGAMATOR.—Stephen Fountain, Silver City, Nevada.

I claim the box, D, having the valve, b, stems, n, or an equivalent device, together with their operating levers, d, and the rods, g, the whole constructed and arranged substantially as and for the purposes herein described.

72,183.—DRIVEN WELLS.—Oscar C. Fox, Georgetown, D. C.

I claim a well tube constructed wholly of woven wire of different textures, as shown, combined and arranged with a drill point, having a drip through its body, all substantially as and for the purposes described.

72,184.—PORTABLE SWITCH.—B. C Galvin, New York city.

I claim, 1st, The single switch, constructed and arranged as described, with bar, D, plate, E, teeth, F, clip of the rail, A A, rail plate, G, wheel guide, C, and leveling lug and casting, L L, and vertical acting hinge, H, in bar, D, as and for the purpose set forth.

2d, The double portable switch, when constructed with vertically hinged arms, A A, attached to plate, O, with frog, F, and movable arm, S, working in notches, R, with movable and sliding side lugs, L L, and parts, B and W, all constructed and combined as and for the purpose set forth.

3d, Also, in the car replacer or switch above described, the three inclines, combined and constructed substantially as described, and for the purposes set forth.

72,185.—RAILWAY SWITCH.—B. C. Galvin, New York city.

I claim, 1st, In railroad switches, as shown in sheet No. 1, figure 1, the construction and arrangement of fixed and movable rails with curved extremities, the movable rails and extremities being hinged to the fixed rails, and the movable rails locking therein by the straight insertion self-connecting rail end joint shown in figs. 2, 3 and 4, and by the dovetail joint in the ends of such rails, fixed and movable, all substantially as described for the purpose set forth.

2d, In railroad switches as shown in sheet No. 2, fig. 5, the construction and arrangement of fixed rails connected by curved extremities, and straight track-crossers, made with hollow ends, all substantially as described, for the purpose set forth.

72,186.—TWINE HOLDER AND CUTTER.—Thomas Garrick, Providence, R. I.

I claim the combination of a cutting blade with a spiral convoluted shield, constructed substantially as and for the purpose specified.

Also, the spring clamp, in combination with the metallic shell for holding the ball of twine, substantially as specified.

72,187.—ARGAND BURNERS.—Elliott P. Gleason, N. Y. city.

I claim, 1st, In argand burners, the regulating screw, for the purposes fully described.

2d, In combination with the same, the lever, for the purposes fully indicated,

72,188.—BURNER FOR HEATING GAS, ETC.—Elliott P. Gleason, New York city.

I claim the use or employment of the tube, C, within the tube, A, in combination with the burner, B, when the same shall be combined, constructed and operated substantially as shown, for the purposes set forth.

72,189.—PRESSURE SAFETY VALVE.—Henry A. Goll, Chicago, Ill.

I claim, 1st, The combination of valves, O, N and H, with cylinder, G, and pipe, F, substantially as set forth.

2d, The valve, H, arranged to operate in cylinder, G, and having a shoulder on the top of it corresponding with the diameter of the valve seat, T, in combination with said cylinder pipe, F, and valves, O N, substantially as herein described.

3d, The combination of cock, C, pipe, E, double valve, O N, and cylinder, B, as and for the purpose set forth.

4th, The valve, O, having the opening, d, in its stem, for the escape of steam above said valve, in combination with a lower valve, N, arranged to receive pressure directly from boiler, A, as set forth.

72,190.—LETTER BOX.—Charles P. Gorley, Boston, Mass.

I claim, 1st, The combination of the lid, B, and springs, D D', in the manner and for the purpose described.

2d, The combination of the lid, B, springs, D D', catch, e, and lever, E, in the manner and for the purpose specified.

72,191.—NAPHTHA BURNER.—L. A. Gouch, Yonkers, N. Y.

I claim the detachable conductor, in combination with a burner constructed and operating substantially as described.

72,192.—STEAM SAFETY VALVE.—Virgil D. Green (assignor to himself and E. M. Hall), Watertown, Wis.

I claim the cylinder, A, the drum, B, the spring, G, the ratchet and pawl, D p, in combination with the cam, m, and the chain, H, substantially as described.

72,193.—MEDICAL COMPOUND.—John Greenwald, Cincinnati, Ohio.

I claim the compound as specified, for the purposes set forth.

72,194.—REEL OVENS FOR BAKERS.—Emily S. Greffet, St. Louis, Mo., administratrix of the estate of Joseph A. Greffet, deceased.

I claim, 1st, The combination of a drum with the revolving pans of an oven, when constructed and arranged substantially as shown and specified.

2d, The arrangement of the regulating flues, p p' p'' p''' of an oven, with their respective dampers and operating rods, when constructed and arranged substantially as shown and specified.

72,195.—BAIL FOR KETTLES.—Wm. Hailes, Albany, N. Y.

I claim constructing the metal sections, B B, with sockets formed within the enlargements, b b, of said sections, such sockets having the ends of a wooden handle fitted into them, and such handle being held in said sockets by a rod, c, which passes through the handle and through the enlargements, b b, and is fastened to the latter, all substantially in the manner shown and described.

72,196.—LOCK FASTENER FOR LAMP.—John Harding, Warrington, Great Britain.

I claim the application, employment, and use of a soft metal or other rivet, or other compressible plug, as a fastening for safety lamps, instead of locks, screws, or other mechanical contrivances now employed.

72,197.—MACHINE FOR CUTTING OUT GLOVES.—Jesse H. Harlan and Thomas Pomeroy, Denver City, Col., assignors to themselves and Wm. H. Harlan.

We claim the adjustable knives of a glove cutter, when constructed and arranged substantially as shown and specified.

72,198.—HARVESTER RAKE.—H. A. M. Harris, Philadelphia, Pa.

1 claim, 1st. The combination as described of the rake arm with the guide, F', both rotating on a common axis.

2d, The combination, substantially as described, of the beater arms, revolving in a fixed relation to a common axis, with the rake having a rotating, a circumferential, and an axial movement around said axis.

3d, The combination, substantially as described, of a stationary collar, to support the raking mechanism, a tubular axle, revolving within said collar, and carrying rake and reel arms, and counterbalance rock shaft, turning axially within said axle, to regulate the movement of the rake.

72,199.—HARVESTER RAKE.—H. A. M. Harris, Philadelphia, Pa.

I claim, 1st, The combination, substantially as described, of a rake rotating on a tubular axis, with a crank shaft, link and counterbalance, to hold the rake down when raking off, to lift it quickly at the end of its backward movement, and to draw it inward when passing forward.

2d, The combination, substantially in the manner described, of a continuously revolving rake, with a counterbalance, and latching and unlatching device.

3d, The combination, substantially as described, of a continuously revolving rake—having a pivot movement in its support—with a cam and compound lever, for the purposes both of turning the rake axially and of holding it in a line radial with its axis while raking off, as set forth.

72,200.—CAR COUPLING.—A. Hillman, Devonshire, England, assignor to Thomas R. Fuller, Samuel Fuller, and James S. McMurray.

I claim, 1st, The coupling boxes, D, constructed as described, and secured to the draught bar or bars, C, by the flanged l, and braces, E, substantially as and for the porpose herein set forth.

2d, The coupling link, K, constructed as herein shown and described, and having two downward projecting pins, k', attached to its lower side in combination with the coupling box, having perforations for the reception of the pins, k', of the link, K, substantially as and for the purpose herein set forth.

3d, The combination of the slotted, wedge-shaped, adjusting block, L, with the coupling link, K, substantially as herein shown and described, and for the purpose set forth.

4th, The combination and arrangement of the coupling box, D, spring, J, pivoted coupling bar, G, uncoupling rod, H, and lever handles, I, with each other and with the draught bar, C, substantially as herein shown and described, and for the purpose set forth.

72,201.—FURNACE FOR SMELTING PRECIOUS METALS.—H. Gengembre Herbert, New York city.

I claim, 1st, The combination of the boxes, D D' D'' D''', etc., the pistons, E E' E'', etc., and screws, f' f' f', etc., or their equivalents, with a cupola, or blast furnace, A, the whole arranged and operating in the manner set forth.

2d, In blast and cupola furnaces, making the lining of a composition of ore and flux, and renewing said lining from the outside by means and with the arrangement herein described.

3d, The combination of the box, M or M', the piston, N or N', and press, P or P', with a reverberatory furnace, arranged and operating in the manner specified.

4th, Forming the hearth of a reverberatory furnace of a concrete of ore ore and flux, and renewing the same from the outside, without stopping the operation of the furnace, by means and with the use of the herein described arrangement.

72,202.—SPRING BED BOTTOM.—Frank A. Huntington, San Francisco, Cal.

I claim the standard, A, with caps or tops, a, and the elastic bands or springs, B, arranged and attached to frames or bars, substantially as and for the purposes herein described.

72,203.—RAILROAD CAR VENTILATOR.—Martin G. Imbach assignor to James L. Howard, Hartford, Conn.

I claim the combination of a reversible deflector, with a spring for moving the same, substantially as before set forth.

72,204.—STEAM ENGINE GOVERNOR.—Oliver A. Kelley, Slatersville, assignor to Lamb, Cook and Co., Forestville, R. I.

I claim, 1st, The valve, M, constructed as described, with the triangular recesses, b b, and downward projecting pin, h, arranged in relation with the pin, i, and screw valve rod, L, as herein described for the purpose specified.

2d, The arrangement of the valve, M, pins, h i, valve-rod, L, sliding rod, K, and pins, j k, as herein described for the purpose specified.

72,205.—APPARATUS FOR SAVING PRECIOUS METALS.—Wm. Chase Knight, Yankee Jim's, Cal.

I claim the V-shaped apparatus, with an adjustable partition, B, substantially as and for the purpose described.

72,206.—JEWEL CASE.—G. F. Kolb, Philadelphia, Pa.

I claim the within described jewel case, composed of the lower portion, A, and the upper portion, A', hinged together by a double hinge, the whole being constructed and operating substantially as and for the purpose herein set forth.

72,207.—SUMMER FURNACE.—Ezekiel C. Little and Jas. W. Bell, St. Louis, Mo.

We claim the construction of a charcoal furnace, having a hinged plate, d, at the back thereof, which, shutting off the draught from beneath, causes it to pass up through the basket.

72,208.—HARVESTER RAKE.—Rufus Little and Lewis Gibbs (assignors to themselves and John R. Bucher), Canton, Ohio.

We claim, 1st, The dropper, composed of two blades that are moved in contrary directions by the rocking of a shaft, and which alternately hold and deliver the grain that has fallen against them, substantially in the manner described.

2d, The rake in combination with the hinged runners or frame, and which moves back and forth on said hinged runners or frame, conforming to the undulations of the ground, to rake the grain upon the ground out of the way and into a gavel for binding, substantially as described.

72,209.—LAMP BURNER.—John C. Love (assignor to W. H. Love), Philadelphia, Pa., and W. H. Love to himself, R. H. Childs and W. H. Childs.

I claim the plate, d, with its flange, i, and opening, w, in combination with the casing, A, of a lamp burner, when the edges of the said opening, w, are parallel to the upper edge of the wick tube, for the purpose specified.

72,210.—REGISTERING YARD STICKS.—Wm. P. Lupton and C. M. Talbot, Cadiz, Ohio.

We claim, 1st, The sliding graduated plate, D, in combination with the yard stick, substantially as and for the purpose described.

2d, The combination of the sliding graduated plate, D, with the knob, k, rod, i, ratchet, r, and spring, g, substantially as and for the purpose specified.

3d, The combination of lever, l, ratchet, r, rod, i, pin, e, and pin, o, for the purpose of disconnecting the actuating rod and ratchet, and replacing the plate, D, substantially as described.

72,211.—ANIMAL TRAP.—C. C. Lyman, Edinboro, Pa.

I claim, 1st, The arrangement of the lever, M, spring check, J, in combination with the slide, C, and box, A, for the purpose and in the manner substantially as set forth.

2d, The lever, M, spring check, J, as arranged in combination with the slide, C, and operated in the manner as and for the purpose described.

3d, The arrangement of the block, S, strip, S', in combination with the spring check, J, in the manner and for the purpose set forth.

72,212.—STOVEPIPE DAMPER.—David Manuel (assignor to himself and Willard Manuel), Boston, Mass

I claim a stovepipe damper formed of two flat cast iron disks, A A, united solidly in the middle, and interlocked by loops, b b, upon the suspension rod, a, with concave radiating edges, c c, arranged and operating as herein described

72,213.—GATE.—John M. May, Janesville, Wis.

I claim, 1st, Pendulum lever, M, and bar, N, operated by suitable mechanism, and combined with a gate that is moved longitudinally in opening and closing substantially as described.

2d, A gate latch combined with rod, L, or its equivalent, when both are so constructed and connected together that the latch may be operated by hand or form a carriage, substantially as and for the purposes described.

3d, Pendant rods, S S, levers, R R, connecting bars, P P, arm, O, pendulum lever, M, and bar, N, when connected together and combined with a gate that is moved longitudinally in opening and closing, substantially as and for the purposes described.

72,214.—HAIR CUTTING MACHINE.—Robert Maynard, Whittlesford, Cambridge, and Jabez James Purkiss, London, Great Britain.

We claim, 1st, The employment of one or more revolving knives, I, in combination with a fixed knife, A, for the purpose specified.

2d, The employment in combination with the knives, A I, of the comb, M, for the purpose specified.

3d, The employment of the inner comb, M, in combination with the outer comb, H, the latch of which is made adjustable for the purpose specified.

4th, Adjusting the comb, H, by means of the rack, L, springs, N, and paw O, or equivalent devices.

72,215.—APPARATUS FOR TREATING FRACTURES AND DISPLACEMENTS.—James S. McClelland, Crawfordsville, Ind.

I claim the device of a fracture adjusting apparatus herein described, consisting of the use of rubber counter extension, C C', fig. 1, extension screw, E, board, H, with cross bar, A, the peculiar shape and design of thigh splint (fig. 2, A,) A A', and (fig. 2 B) B B', substantially as herein set forth.

72,216.—STEAM GENERATOR.—Geo. Miller, Melbourne, Victoria, executor of the estate of James F. McKenzie, deceased.

I claim, 1st, The generating and superheating tube, G, constructed as described in sections, the points of connection of each section provided with an inner disk, having a central opening, as herein set forth.

2d, The tubes, B, constructed as described, in combination with the thermostadt, one or more, and arranged in the furnace, as herein set forth and represented.

72,217.—DRY GAS METER.—Edmund Meredith (assignor to himself and J. S. Sellers), Philadelphia, Pa.

I claim the application of the inclined planes, c'', either to the carrier, C, or to the rotary disk, B, so as to operate substantially as and for the purpose described,

72,218.—SLOTTING MACHINE.—Joseph W. Moore, Cambridgeport, Mass.

I claim the combination of mechanism as described, for the purpose set forth, and for the object specified.

72,219.—LAMP.—George Neilson, Boston, Mass.

I claim, 1st, The combination in a burner such as described, with the elevated dome-supporting disk, of a dome or deflector hinged to said disk, substantially as and for the purposes set forth.

2d, The combination with the dome or deflector and the arm projecting from its base, of the dome-supporting disk and slot formed in the same for receiving and holding said arm, substantially in the manner and for the purposes set forth.

© 1868 SCIENTIFIC AMERICAN, INC.

3d, The combination with the dome-supporting disk, of a ring of leather or other suitable material which is a non-conductor of heat, secured upon the periphery of said disk, substantially as and for the purposes set forth.

4th, The base or chimney rest, constructed substantially as herein described, that is to say, provided with a series of radial corrugations, which, when the chimney is in place, allow the external air to pass into the burner between the base of the chimney and the said rest, substantially as set forth.

5th, The combination of the radially corrugated base or chimney-rest, with the dome-supporting disk and dome or deflector hinged to said disk, under the arrangement and for the operation as set forth.

72,220.—BRICK MACHINE.—John North, New York city.

I claim, 1st, A mold wheel or frame made of annular or ring shape, and suspended upon rollers, substantially as and for the purpose described.

2d, The combination of the mold wheel or frame, K, arranged to have an intermittent rotary motion, with the follower, Z, or its equivalent, within the feed hopper X, and box, Y, when such follower is arranged for operation with regard to the mold wheel, substantially as and for the purpose described.

3d, The combination with a mold wheel or frame, K, arranged to have an intermittent rotary motion, and the frame, B2, so disposed and arranged about such wheel as to exert a pressure upon the clay within its molds, substantially as and for the purpose specified.

4th, The mold-weel or frame, K, arranged to have an intermittent rotary motion, the stems, M2, the presser frame, B2, and the molds, O O O O, so combined and arranged as to operate simultaneously, substantially as and for the purpose set forth.

5th, So arranging the endless belt or apron, in combination with the stationary clearer-board, W2, and brush, V2, rocker shaft arm, I, and pawl lever, V2, when operated on the gear, z, causing an intermittent rotary motion, substantially as and for the purposes described.

6th, The brushes, X2 and B3, in combination with a mold wheel, arranged to have an intermittent rotary motion, when such brushes are disposed for operation upon the said wheel and are only revolved or actuated when the is in motion, substantially as described, for the purposes speci ed.

72,221.—HAY PRESS.—Geo. Noyes, Pownal, Me., assignor to Andrew Leighton and M. L. Whitney.

I claim, 1st, The combination of the springs, 4, and levers, r, as and for the specified purposes.

2d, The combination of the ears, u, springs, 4, and levers, r, as and for the specified purposes.

3d, The adjustable doors, m, with trucks, o, as and for the purposes described.

4th, The combination of the clamps or cams, x z, levers, y and 2, and lever, 3, all as and for the purposes described.

72,222.—RAILROAD RAIL.—Clark Osgood, Cape Elizabeth, Me.

assignor to himself and Frederick A. Prince.

I claim the rail composed of the support, A, and cap rail, C, when the two parts are placed together as shown by 1 2, and when the several cap rails are also united by the horizontal pintle, d, substantially as and for the purposes described.

72,223.—NUTMEG GRATER.—W. W. Owen and Daniel Kelly, Muskegon, Mich.

We claim the nutmeg grater, constructed as described, consisting of the T-shaped tube, A, whose short section is at right angles with the longer section, and has upon one end the flat circular box, G, placed parallel with the longer tube, and containing the revolving grater wheel, F, said short tube receiving the plate, B, spring and rod, D, all arranged and operating as herein shown and described.

72,224.—MANUFACTURE OF JEWELRY.—John S. Palmer, Providence, R. I.

I claim, 1st, Forming the raised metal shell merely of the general outline of the shape in which it is finally to be produced, substantially as and for the purpose specified.

2d, Forming the alloy filling of a shape to fit the interior of the said shell, in one piece or shape, substantially as and for the purpose specified.

3d, Reducing the said outline shell and the filling, after the same have been united into one piece, as described, to its perfect finished shape, and ornamenting the same by rolling or other suitable means, substantially in the manner described.

72,225.—MACHINE FOR FOLDING ENVELOPES.—Robert Parks (assignor to E. J. Spangler), Philadelphia, Pa.

I claim, 1st, The blade, F, the recessed or grooved block, J, rods, h, and receiver, D, the whole being combined and arranged for joint action, substantially as and for the purpose herein set forth.

The sliding bar, E, its blade, F, and plate, d, with curved slot, d', in combination with the crank, M, the whole being arranged and operated substantially as and for the purpose described.

72,226.—STAKE HOLDER IN CARS.—O. R. Parmele, Aurora, Ill.

I claim the socket or stake holder, constructed with the right angular slots, I, and notches, L H, in combination with the pins, F F, in the lower end of the stake, substantially as and for the purpose described.

72,227.—CULTIVATOR.—C. B. Petengill, Hebron, assignor to Freeman C. Merrill, Paris, Me.

I claim, 1st, The circular draw beam, A, having the wheel straps, a1, draft bars, a2, socket, a3, and ears, a4, cast solid therewith, substantially as herein shown and described.

2d, The combination of the bent adjusting rod, F, with the front tooth, E, and with the central beam, C, of the cultivator frame, substantially as herein shown and described and for the purpose set forth.

3d, The combination of the ring bolt, I, curved adjusting bars, H, and beams, C and D, with each other, substantially as herein shown and described, and for the purpose set forth.

4th, The combination of the bent adjusting rods, F, circular draw beam, A, and teeth, E K L, of different lengths, with each other, and with the beams, C and D, of the cultivator frame, substantially as herein shown and described, and for the purpose set forth.

72,228.—SKIRT-IRONING TABLE.—Alfred S. Phillips, Boston, Mass.

I claim the skirt-ironing table, as composed of the top or board, the pair of legs hinged thereto, and the pair of separable legs, and the dovetailed connections, as described, for connecting the separable legs to the board or top, in manner as specified.

72,229.—HEATING FURNACE.—Chas. R. Rand, St. Louis, Mo.

I claim, 1st, The shaker grate, C provided with the points, a, and pivot, b, arranged to rest upon the grate, A, and operate substantially as described and for the purpose set forth.

2d, The smoke flues, l m n, and air flues, a', in connection with the hot and cold air chambers, and the dampers, ij and r, and pipes, p, when arranged to operate substantially as described.

3d, The water-vessel, W, in connection with the crane, S, when arranged to operate substantially as described.

4th, The ashpan, M, with its sliding bottom, N, in connection with the pipe, O, when arranged to operate as shown and described.

5th, The openings, R V t, for obtaining access to the chimney, and the opening, Z, in the hearth plate, in connection with the opening in the partition, J, with their movable covers, when arranged as described and for the purposes set forth.

6th, The half-conical form of the fireplace, with the globe top, having the divisions therein for the air flues, as shown, as well as the arrangement for dividing the smoke, with the shutter, E, provided with the door, g, and damper, h, when arranged as described and for the purposes set forth.

72,230.—MACHINE FOR MAKING NAILS.—Benjamin Robinson, Boston, Mass.

I claim, 1st, in combination with a feeding device, so arranged as to feed the forward edge of the nail sheet past the foremost edge of the upper die by the width of one nail at each stroke of the cutter head, and a pressure bar, Z, slotted as shown, the arrangement of the male dies, C, and female dies, K, placed in transvers series, heads to points, substantially as and for the purpose described.

2d, The arrangement of lever, W, spring, U, standard, V, and nut, X, in combination with the journal of roll, N, as and for the purpose described.

3d, The arrangement of female dies, K K, made in halves, in crossbars, J, as held by bolts, L, and adjusted by set screws, E and F, as and for the purposes described.

4th, The arrangement of levers, S S2, connecting rods, R R2, substantially as and for the purpose described.

72,231.—LOCOMOTIVE LINK FOR TRUCKS.—Thos. J. Rowley and William Poland, Chillicothe, Ohio.

I claim the link or radius bar, A, combined with the slide box, B, and the stiffening bar, C, constructed as and for the purpose herein described.

72,232.—HORSE HAY FORK.—George W. Shade, Shippensburg, Pa.

I claim a hay fork, constructed in the manner substantially as described, with one or more pairs of prongs, in combination with bars, B B', toggle joints a, spring, C, handle, D, and trip catch, E, all operating in the manner as and for the purpose set forth.

72,233.—WHEEL FOR WAGONS AND CARRIAGES.—Fred. G. Simmons, Lansingburg, N. Y.

I claim, 1st, The employment of the socket cylinders, C and D, one cast on the hub, A, the other disconnected therefrom and working freely thereon, and in combination with the said hub, A, substantially as herein described and set forth.

2d, Also, in a wagon hub, the socket cylinders, C and D, the hub, A, and the nut or cap, B, constructed and arranged in the manner and for the purposes substantially as herein fully described and set forth.

72,234.—INHALING TUBE.—Samuel W. Sine, Easton, Pa.

I claim, 1st, The metallic valves, D and E, the diaphragm, c, stop, e, and the spring, d, in combination with an inhaling tube, substantially as and for the purposes described.

2d, A metallic valve, either with or without a stop or spring, in combination with an inhaling tube, substantially as described.

72,235.—LET-OFF MOTION FOR LOOMS.—George Smith, Cumberland, R. I.

I claim the combination of the mechanism for controlling the let-off warps as described, with a binder or break, for rigidly confining and holding the whip roller in its latest position at the moment that the lathe beats up the filling, substantially in the manner described.

72,236.—CORN HARVESTER.—H. L. Smith, Watkins, N. Y.

I claim, 1st, The combination of the hand lever, D, with the platform, A, and thills, C, without intermediate parts, so arranged that the platform is tilted by simply raising the lever, as herein set forth.

2d, The arrangement, with the tilting platform, of the parts constituting the gearing operating the knives, I, and reels, M, the same consisting of the gears, 1, 2, 3, 4, the shafts, H H', with the collars, g g', operated by levers, K K', and the pulleys and bands, k k l, the whole constructed and operating in the manner and for the purpose specified.

72,237.—TRUNK.—Thomas Smith, Brooklyn, N. Y.

I claim, 1st, The tray, B, of a truuk, when provided with a hinged bottom, b, substantially as and for the purpose herein shown and described.

2d, So arranging a trunk, A, and its tray, B, that the latter can be secured in an inverted position upon the cover of the trunk, by means of straps, or otherwise, substantially as herein shown and described, so as to form a separate compartment upon the trunk, as set forth.

72,238.—HARVESTER.—George H. Spalding, Rockford, Ill.

I claim, 1st, The receiving box, B, located between the driving wheel and the first guard finger, substantially as and for the purpose herein shown.

2d, The location of the footboards, f f', on each side of the receptacle, B, which permits the binder to face the receptacle, substantially as set forth.

3d, The raised footboard, f', which admits the grain beneath it, substantially as and for the object specified.

4th, The delivery of the grain into the receptacle at its bottom or base, substantially as and for the purpose set forth.

5th, The employment of metallic strips, S S S, and belts, b b, as apron or carrier, substantially as and for the purpose herein shown.

6th, The securing of the said metallic strips, S S S, at their forward edges, substantially as herein shown, so that in passing over the roller they will assume a vertical position and thrust the grain into the receptacle, all as set forth.

7th, The employment of a receptacle, B, for the grain, which admits of the binding of the bundles upon the loose grain in it without removing the bundle till completed, substantially as and for the purpose hereinbefore mentioned.

72,239.—MARINE ENGINE GOVERNOR.—Jas. Sullivan, South Boston, Mass.

I claim the arrangement of valve, B, lever, E, weight, I, and counter weight K, operating substantially as and for the purpose described.

72,240.—STEAM GENERATOR SAFETY VALVE.—Henry Taylor and Joseph M. Cole, Baltimore, Md.

We claim, 1st, The combination of the weight and valve, when connected by a flexible joint, substantially as and for the purpose described.

2d, Also, in combination with the closed self-acting safety valve, the valve, J, which is held shut by the steam in the boiler when at or below its regulated pressure, and opened by the steam in the boiler when its pressure rises above that which it is designed to carry, substantially as described.

3d, Also, in combination with the passage, H, the projecting top piece, L, to prevent said passages from being stopped up, but at the same time allow the steam to escape through them when blown off through the safety valve, as described.

4th, Also, the combination of the crank shaft and lifter with the weight, D, and valve, C, so that the attendant can at any time open the safety vale, and allow the steam from the boiler to pass through, but cannot close said valve to prevent the escape of steam when its pressure exceeds that for which the safety valve is computed, as set forth.

72,241.—STILLS.—Isaac P. Tice, New York city.

I claim, 1st, The arrangement of the filling and discharging orifice of a still below the surface of the wash, for the purposes herein described.

2d, Also, the valve opening inward upon the main pipe.

3d, Also, the valve attached to the overflow pipe in such a manner as to be opened when the still is operating, and closed when it is not working.

4th, Also, connecting the two valves, c and d, so that they will act simultaneously, as hereing described.

5th, Also, the combination of these valves with the still and its necessary working apparatus.

6th, Also, inclosing the collapse and blow-off valves of a still, and connecting them, by means of a pipe, with the doubler, worm, or any other part of the enclosed circuit.

72,242.—STONE FOR HEATING SADIRONS.—John P. Troxell, Hancock, Md.

I claim, 1st, The horizontal recesses, M, in the top part of the stove, provided with slots, O, formed by the partitions, N, and the chamber, E, at the sides and rear of the recesses, M, substantially as and for the purposes described.

2d, The chamber, E, formed as described, connecting with the fireplace by means of the openings, D, and provided with holes, P, for cooking purposes, in combination with the recesses, M, substantially as and for the purposes described.

72,243.—BOOKBINDER'S BEVELING MACHINE.—H. L. Tumy, Cincinnati, Ohio.

I claim, 1st, The roughened beveling leaf, C, for the purpose above specified.

2d, The bedplate, B, beveling leaf, C, gaging bar, D, and pawl, g, arranged and operating substantially as and for the purpose herein described and set forth

72,244.—ARGAND BURNER.—E. R. Walker, New York city, assignor to E. P. Gleason.

I claim the combination of a disk or plate of metal with a regulating screw, for the purposes fully described

72 245.—ATTACHING PICKS TO THEIR HANDLES.—J. P. Walsh, Halena, Montana.

I claim the attachment of a tool to its handle, a dovetail projection, a, from the tool, interlocking with a corresponding slot, e, in the head of the handle, and retained therein by an encircling band, E, a transverse pin, or other equivalent device, substantially in the manner set forth.

Also, the independent metallic side pieces, D, when formed substantially as herein described, and united to a handle, B, so as as to receive and retain a dovetail projection, a, of a tool, substantially as and for the purpose herein specified.

72,246.—MODE OF PREPARING FAGGOTS FOR MANUFACTURING WROUGHT BEAMS OR GIRDERS.—George Walters and Thomas Shaffer, Phœnixville, Pa.

We claim a pile or fagot for wrought-iron beams, composed in part of a solid bar or bars, with a rib or ribs, e, and in part of a number of bars riveted together and wedged to the said rib or ribs, all as set forth for the purpose specified.

72,247.—CORK EXTRACTOR.—William G. Waterman, Middletown, Conn.

I claim the combination of the corkscrew, B, and the spring, E, both being attached to the handle, A, in the manner herein set forth and described.

72,248.—WHIFFLETREE.—Geo. Watt, Richmond, Va.

I claim, 1st, The whiffletrees A A', formed of bent metal, with three straight sides, one of which is enlarged in the center, to sustain endwise pressure, as described.

2d, In bent metal whiffletrees the replaceable rings or thimbles, B, substantially as and for the purposes set forth.

72,249.—STRAW CUTTER.—J. Weichart, San Francisco, Cal.

I claim, 1st, The manner of operating the feed roller, B, by the toothed wheel C, and cam, D, substantially as and for the purposes described.

2d, The cam, E, in combination with the arms, d d', jointed to the knife, and the spring, H, for throwing it back, substantially as described; and

3d, The movable pressure plate, b, spiral springs, c c, so that the material to be cut will be held firmly in place, substantially as described and shown.

72,250.—MARBLE-CUTTING MACHINE.—G. W. Wheeler, New Fairfield, and H. I. Stevens, Bethel, Conn.

We claim the frame, B, constructed as described, so that the roller guides may be adjusted as described.

72,251.—RAILROAD SWITCH. — James M. Whiting, Providence, R. I.

I claim the construction and arrangement of the switch, S, in such a manner as that it may be properly shifted by the rail car in the act of passing over the same, substantially as described.

72,252.—SOAP REST.—J. Whittemore, South Reading, Mass.

I claim, as a new article of manufacture, a soap rest, consisting of the shelf A, and bracket and spring, D C E, made substantially as described and for the purpose set forth.

72,253.—LAMP CHIMNEY.—J. D. Willoughby, Shippensburg, Pa.

I claim, 1st, A lamp chimney with the flange, I, or its equivalent, as and for the purpose set forth.

2d, A lamp top with the catches, o o, or their equivalents, as and for the purpose set forth.

3d, The lamp chimney with the flange, I, and the lamp top with the catches, o o, in combination with the spring, U, or its equivalent, as and for the purpose set forth.

72,254.—APPARATUS FOR MELTING AND STRAINING CRUDE TURPENTINE.—Josiah E. Winants, Brooklyn, N. Y., assignor to himself and John F. Griffin.

I claim the employment of a rotary heating and straining cylinder, substantially in the manner and for the purposes set forth.

72,255.—BUCKLE.—E. L. Woods, Alliance, Ohio, assignor to himself, Joshua H. Woods, Benjamin F. Woods and James L. Woods.

I claim the plate and clips, B B, projection, a, in combination with hinge holder, D, and tongue, d, constructed substantially as described and operating as set forth.

72,256.—MILLSTONE DRESS.—Notley W. Wortham (assignor to himself, S. C. Hendry, M. L. Watson and P. W. Printup), Union Point, Ga.

I claim the improved millstone dress consisting of the four furrowed sections at right angles to each other, in the manner described and for the purpose specified.

72,257.—STALL FOR CATTLE AND HORSES.—Louis B. F. Sitkov, Portland, Me.

I claim the improved stall substantially as described combining the secondary floor and bedding box, as and for the purposes set forth.

72,258.—STEAM PIPE FOR CONNECTING HEATING PIPES IN RAILROAD CARS.—Charles R. Abbot, Elmira, N. Y.

I claim the combination and arrangement of pipes, A and B, ball and socket joints, C and D, and pipes, E and F, substantially as and for the purposes described.

72,259.—COFFEE MILL.—John R. Adams, New York city.

I claim the pivoted lid of the mill attached by an arm to the grinder shaft, for the purpose of turning the grinding cone, as described.

72,260.—HARROW.—John Aiken, Warner, N. H.

I claim connecting the rollers, B, to each other in pairs by chains, C, or equivalent flexible or jointed connection, substantially as herein shown and described and for the purpose set forth.

72,261.—COMBINED DAMPER AND VENTILATOR.—Alexander Anderson, London, Province of Ontario, Canada.

I claim, 1st, The slotted damper, B, with depressions or pockets, b, to provide an indirect passage for the smoke when closed and with a weight, b1, to retain it in its open position.

2d, The sliding lever, D, constructed and applied substantially as shown and described in combination with a notched plate, E, by which the lever and damper are held in any desired position.

3d, The combination with the joint of stovepipe, A, provided with apertures, a a, and horizontal slots, a1, of the damper, B, and perforated ventilator, C c, constructed, arranged and adapted to be separately operated by the same handle, substantially as set forth.

72,262.—SIGNAL LANTERN.—L. V. Badger, Chicago, Ill.

I claim a signal lantern for street railroad cars composed of a box inserted in the roof and provided with a lamp, reflectors and glass or transparent sides, substantially in the manner as herein shown and described.

72,263.—RAILROAD WEED CUTTER.—J. S. Boicourt, Boonsboro', Iowa.

I claim the arrangement of the circular cutters, d, and the straight cutter bar, F, or either of them, in combination with a railroad truck, A, substantially as and for the purpose herein described.

72,264.—SHAFT COUPLING.—M. C. Boyer, Norristown, Pa.

I claim the within-described coupling composed of the two clamps, B and B', adapted to the shafts and nuts, D and D', adapted to tapering screws, a a on the clamps, all as set forth and for the purpose specified.

72,265.—ANIMAL POKE.—G. W. Carpender, Jarvis, Ind.

I claim the bow, A, rounds, B and C, bar, D, rod, E, and collar, F, with its points, the several parts being constructed and used as and for the purpose set forth.

72,266.—TRACE CLAMP.—D. H. Clock, Monroeville, Ohio.

I claim the construction of a clamp in the manner substantially as described as a new article of manufacture when applied to the purpose specified.

72,267.—SORGHUM EVAPORATOR.—Noah Clouse, Buffalo Village, Pa.

I claim, 1st, The manner herein shown and described of hanging the vessels, A, in the carriages, B, by means of plates, C, having pins, a, and screws, b, and by means of steadying pins, c, as described.

2d, The carriages, E E, when provided with adjustable casters having plates, e, on their upright axles and secured by pins, d, in any desired position, as described.

3d, The arrangement of the frame, E, divided into sections to allow the easy transportation of the vessels, A, from one section to the other, as described.

4th, A sorghum evaporator consisting of a series of separate vessels, A A, hung in carriages, B B, and moved in succession from the filling place over the furnaces, F and G, to the cooling pan or discharge, substantially as described.

72,268.—BOAT LOWERING APPARATUS.—A. F. Crosman, Steamer *Ossipee*, U. S. N.

I claim the notched spring catch, G, in combination with the weighted chains, b, and jointed davits, E, as herein described for the purpose specified.

72,269.—STUMP EXTRACTOR.—Alonzo Crowner, Wellsville, N. Y.

I claim, 1st, The screw shaft, A, applied to transporting trucks and provided with means for rotating it for the purpose of extracting stumps and stones, substantially as described.

2d, Providing a screw shaft, A, which is applied to two trucks substantially as described with drums, G G', connected together by spur wheels so as to rotate in opposite directions, in combination with right and left pawls, h h', and ratchet wheels, e e', substantially as and for the purposes described.

3d, The pendent guides, J J, for supporting pulleys, i j, over which the ropes, k k', of drums, G G', pass in combination with a machine operating substantially as described.

4th, Sustaining the front end of the screw shaft upon or by means of a head block, D, which is attached to a bolster, D', by a staple, E, so that it can rise and fall, substantially as described.

5th, The combination of the screw, A, nut, a', and prop, P, substantially in the manner and for the purpose herein described.

6th, The combination of rods, F F, with a right and left screw shaft, A, which is supported upon trucks, and operated substantially as described.

72,270.—HORSE HAY FORK.—Fred Culver, Elkland, Pa.

I claim the combination of upright shaft, C, rivets or pins, B B, arms, D D, with slots, a a, at their upper end and barbs at their lower end, the whole arranged substantially as and for the purpose specified.

72,271.—NEEDLE CASE.—P. D. Cummins, Portland, Me.

I claim the combination of the cylinder, a, rod, b, tube, d, and cushion, k, substantially as and for the purposes set forth.

72,272.—DEODORIZING INDIA-RUBBER, GUTTA-PERCHA, ETC. Edward de la Granja, Boston, Mass.

I claim, 1st, The solution above described, when used as and for the purpose specified.

2d, The process of deodorizing and perfuming india-rubber and gutta-percha, above described.

72,273.—WOOD-TURNING LATHE.—David Dick, Corning, N. Y.

I claim, 1st, The two sliding tool beds, M O, provided with adjustable cutting tools and operated simultaneously toward and from each other at opposite sides of the lathe bed by means of the cam, E, arm, J, rock shaft, H, and double crank, I, all constructed and arranged to operate substantially as shown and described.

2d, The slotted arm, J, with the pin, b', of the cam, E, applied to the cam, E, and rock shaft, H, substantially as shown for the purpose of moving the slides, M O, slowly toward each other and with a quick movement outward from each other, as set forth.

3d, The rising and falling hopper, W, operated automatically from the sliding bar, D, through the medium of the arms, Z C', and pin, u, all constructed to operate substantially as and for the purpose set forth.

4th, The lubricating chamber, Y, in the hopper, W, arranged in relation with the center point, a', operating substantially as and for the purpose specified.

5th, The flanged center point, b, on the mandrel, C, with the eye, r, working over said point and operated automatically from the sliding bar, D, constructed and operating substantially as and for the purpose set forth.

72,274.—RAILROAD CAR VENTILATOR.—William B. Dunning, Geneva, N. Y.

I claim a window sash or other frame made of two frames one within the other and hinged or otherwise hung the inner to the outer and the outer to any suitable frame, so as to be susceptible of the operation substantially as and for the purpose described.

72,275.—LAMP CHIMNEY TONGS.—Jacob Euteneur, Peoria, Ill.

I claim the grasping claws and handle of chimney tongs, when constructed and arranged substantially as shown and specified.

72,276.—RAILROAD SPIKES.—Morrison Foster, Cleveland, Ohio.

I claim, in combination with hook-headed railroad spikes the so enlarging of the head and continuing it as that there will be formed in conjunction with the head a shoulder at the rear of the spike, on a line below the under side of the hook of the spike, so that said shoulder shall come in contact with the wood into which the spike is driven a little before the hook comes in metal contact with the flange of the rail it is to hold and thus prevent any liability to fracture or over strain the head of the spike, substantially as described.

Also, in combination with the shoulder at the rear of the spike, when formed with a continuation of the head and located with regard to the under side of the hook, as above described, the shoulders at the sides of the spike and on a line with the shoulder, b, and auxiliary thereto for the purpose of shedding the rain or other water from the hole made by driving in the spike and thus preventing the rotting of the cross tie and consequent loosening of the spike, substantially as described.

Also curving the lower portion of the shank of the spike backward in combination with the rear inclination to form the point for the purpose of causing it to hug the edge of the flange of the rail as it is driven in alongside of it, substantially as described.

72,277.—JACK FOR PULLING HOP POLES.—O. S. Foster, Durhamville, N. Y.

I claim the metallic head, D, having trunnions and claws, E E, all formed of one piece and connected to L-shaped standards, B B, which are secured to a block, A, and provided with a suitalble handle, C, all constructed and used for the purpose specified.

72,278.—FURNACE FOR STEAM BOILER.—Charles Fownes, Pittsburg, Pa.

I claim, 1st, The smoke consumer composed of the diaphragm, T, with its set of burners, U U' U'' U''' U'''' etc., and burner, V V, channel, J J, openings, K K, and blowers, M M, or their equivalent, arranged and operating as specified.

2d, The diaphragm, T T, curved or corrugated so as to obtain more heating surface and to form channels for collecting the dust, as described.

72,279.—HINGING TEA KETTLE COVERS.—Charles Fownes, Pittsburg, Pa.

I claim, 1st, Swinging the lid of a tea kettle around a center placed or located to the right or to leit of the bail ear, D, out of the center line of the spout and nearer to the spout than to the back of the tea kettle so that the lid in pivoting around that center will swihg clear of the bail lug, G, without being elevated to pass over it, as set forth.

2d, The combination of the pin, M, or pins, N N, with the knob, G, or its equivalent.

3d, The combination of the split piece, P, or pieces, P P', with the knob, G

4th, The combination of the screw, V, cast or chilled in with the piece, G.

5th, The combination of the washer, W, with the pieces, M N N P P' V, and the knob, G, and rim, H, used for the purpose set forth.

6th, Securing the lids of tea kettles by means and with the use of the screw, F, bolt, V, pin, M, pins, N N, or pieces, P P', as described.

72,280.—SADIRON HEATER.—S. C. Frink, Indianapolis, Ind.

I claim, 1st, The peculiar-formed base piece, L, as represented in Fig. 3, with the air, gas and cotton chambers attached separated by gauze wire or perforated metal, substantially as set forth.

2d, Also the metallic ring or band, K, Fig. 4, when used to bind or make fast the gauze wire or perforated metal, P, on the gas, air or cotton chambers, I I, as represented in Fig. 3 of drawings, substantially as herein set forth.

3d, Also the peculiar-shaped shell or cover, E, with the inclined plane, A, lug, O, and bevelled sides, C, to receive the flat or tailor's iron, as represented in Fig. 1 and 2, substantially as herein set forth.

4th, Also the whole device, when constructed and operated substantially as set forth.

72,281.—WASHING MACHINE.—Thomas Q. Frost, Indian River, N. Y.

I claim the combination of the dashers, C, rods, D, gear wheel, E, pinion, F, crank shafts, G d, pitman, K, grooved rollers, O, and adjustable rollers, L, as herein described for the purpose specified.

72,282.—HORSE HAY FORK.—William B. Gabel, East Cocalico Township, Pa.

I claim the vertical bolt, D, entering the eyes of a flattened hook, C, which terminates a single arm, A, forked at the other end and connected to a similar forked arm, B, by a central rivet all arranged as above described and in combination with the lever, E, ring, I, and one or two pulleys, K J, all arranged and operating in the manner and for the purposes specified.

72,283.—IRON SAFES.—William Gardner, New York city.

I claim, 1st, The Z-shaped frames, c and e, in combination with the pins, f, substantially as and for the purpose herein shown and described.

2d, The Z-shaped frames, c and e, in combination with the pins, g, on the door, A, substantially as set forth.

3d, The removable pins, g', and plate, i, in combination with the Z-shaped frames c and e, substantially as set forth.

4th, The grooved bottom, K, of the safe in combination with the false bottom, m, the latter being provided with a dovetail or other projection, l, substantially as herein shown and described.

72,284.—CHECK REIN ATTACHMENT.—M. A. Gates, Troy, Pa.

I claim the combination of the check rein hook, B, strap, C, turret ring, A, stop ring, D, hook ring, E, strap, F, end ring, G, and hook, H, with each other when used in connection with the cheek rein, saddle or pad, and back strap of a harness, substantially as herein shown and described and for the purpose set forth.

72,285.—LUBRICATING SPINDLE.—A. H. Gilman, Hopedale, Mass.

I claim the combination of the chambered nut, E, provided with an absorbent material as set forth with the bolster or with the same and the bushing to extend down from such bolster, as explained.

© 1868 SCIENTIFIC AMERICAN, INC.

Also the combination of the chambered nut, E, provided with an absorbent as set forth with the bolster and its chamber, e, furnished with an absorbent material, arranged so as to lie against the spindle, as specified.

Also the combination of the chambered nut, E, the chambered bolster and bushing provided with a passage and an absorbent material to extend through such passage and against the spindle, as described.

Also the combination of the lubricating chamber, i, and its supply passage, k, with the gear, F, the bearing thereof and the conduit, e, or its equivalent, arranged in the bolster and to open against the spindle, as specified.

72,286.—HORSE HAY FORK.—J. S. Gochnauer, York, Pa.

I claim, 1st, Operating the movable toes by means of an oscillating roller, C, substantially as herein shown and described.

2d, Strengthening and bracing the tines by means of the roller which operates the toes, in the manner substantially as herein shown and described.

3d, The combination of the spring lever, F, with the oscillating roller, C, and the tines, A, substantially as herein shown and described.

4th, The locking recess, b, when used in combination with the spring lever, F, substantially as herein shown and described,

5th, The discharge lever, K, arranged and operating in combination with the said locking recess and the spring lever, as set forth.

72,287.—VALVE FOR BOILER FEEDER.—Richard Gornall, Baltimore, Md.

I claim the combination of the float, F, and valve, v, seating upward, with the chambers, C and C', the pipes, D S W, and the cylinder, A, the valve being attached directly to the float, F, by the valve stem, f, and the parts operating without levers or gear of any description, but substantially in the manner and for the purposes specified.

72,288.—BOLT-HEADING MACHINE.—Robert Gracey, Pittsburg, Pa.

I claim, 1st, The combination of the cam, C, the weighted drop lever, C', the toggle, F, and the heading hammer, constructed, arranged and operating together substantially as described.

2d, The combination of the cams, D and D', the levers, E and E', the toggles, G and G', and the movable heading and griping dies, constructed, arranged and operating together substantially as described.

3d, In combination with the heading hammer the toggle, F, the drop lever, C', and cam, C, an elastic post, stud or other elastic bearing to arrest the descent of the drop lever and cause it instantly to rebound and remove the hammer from the heated iron, substantially as shown and described.

4th, In combination with the heading and gripping dies the piston, k, and stake, s, arranged and operating as described to detach the finished bolt from the dies.

72,289.—POTATO DIGGER.—E. V. W. Griffith, Utica, N. Y.

I claim, 1st, The fork, D, the bent lever, D1, and the pin, G1, or their equivalents, in combination, for the uses and purposes mentioned.

2d, The fork, D, operated by the lever, D1, and pin, G1, in combination with the screen, H, substantially as described and for the uses and purposes mentioned.

3d, The fork, D, and the bent axle, A1, and lever, D1, in combination, for the uses and purposes mentioned.

4th, Operating the fork automatically by means of the gearing, E and F, and the pin, G1, substantially as described and for the uses and purposes mentioned.

72,290.—ASH HOUSE.—Moses Hall, Jr., Osborn, Ohio.

I claim, 1st, A fire-proof ash house and leach tub combined, substantially as shown and described and for the purposes set forth.

2d, The fire-proof box, A, in combination with the hopper, B, and screen, C, substantially as shown and described and for the purpose set forth.

3d, The fire-proof leach tub, D, in combination with the parts, K, and screen, S', substantially as shown and described and for the purposes set forth.

4th, A fire-proof box, C, in combination with the fire-proof leach-tub, D, substantially as shown and described, and for the purposes set forth.

72,291.—MACHINE FOR SPLITTING RATTAN.—Levi Heywood, Gardner, Mass.

I claim an independent tube or quill, E, which may be adjusted more or less in advance of the cutters, substantially as and for the purpose set forth.

72,292.—MACHINE FOR BENDING WOOD.—Levi Heywood, Gardner, Mass.

I claim the molds, A and B, in combination with the lever, D, or its equivalent, all constructed to operate in the manner substantially as and for the purpose set forth.

72,293.—MACHINE FOR BENDING WOOD.—Levi Heywood, Gardner, Mass.

I claim connecting the links, A, of a chain for bending wood by one or more flexible ropes, B, substantially as set forth.

72,294.—CINDER SHOVEL.—J. E. Hignutt, Denton, Md.

I claim the cinder shovel herein described, constructed with a vertical handle, A, and a horizontal or nearly horizontal toothed scoop, C D, substantially as and for the purpose set forth.

72,295.—BURIAL CASE.—Robert F. Hill, Philadelphia, Pa.

I claim the body, A, provided upon its upper edge with the flange, d, projecting within and without the case, having in its under side, within the case, the countersunk nuts, i, the corresponding flange, h, upon the lower edge of the cover, B, said flanges, secured together by the thumb screw, C, passing through both and into the countersunk nut, i, the head of said screw being without the cover, and the end within the body, A, as herein described, for the purpose specified.

72,296.—KNITTING MACHINE.—Wm. H. H. Hollen, Fastoria, Pa.

I claim, 1st, The combination and arrangement of the wheel, B, having a groove, b", with the arm, G, of the rock shaft, H, as described and shown, for the purpose of giving the necessary movements to the stitch lifter, C, thread carrier, D, and the pressers, E and F F, as described.

2d, In combination with the elements of the preceding first clause, the studs, b' b' b', in the disk-wheel, B, and the teeth, a", in the needle carrier, A, when arranged to move the said carrier, A, at the periods required by the said stitch lifter, C, thread carrier, D, and pressers, E and F F, as described.

3d, Also, the grooved and bent needle, a', in combination with the stitch lifter, C, both constructed as described, for the purpose specified.

4th, Also, the stitch lifter, C, made in the form shown, *i. e.*, with the three projections, 1 2 3, for the purpose of causing the stitch lifter of the machine to operate, in combination with the grooved and bent needles, a', in the manner and for the purpose described.

5th, Also, the thread carrier, D, made with curved sides and edged ends, substantially as and for the purpose described.

6th, Also, the vibrating stitch presser, E, formed as described, at its lower end, for the purpose of causing it to pass more closely along the lower sides of the needles in forcing back the stitches, as described.

72,297.—CULTIVATOR.—Henry Howe, Oneonta, N. Y.

I claim, 1st, Extending the rear end of the central beam, C, back to receive and support the rear or central plow standard, D, substantially as herein shown and described.

2d, The gage-wheel frame, J, constructed substantially as herein shown and described, and pivoted to the central beam, C, or to some other support at the central part of the cultivator frame, as and for the purpose herein set forth.

3d, The combination of the lever-latch, N, with the beam, C, and gage-wheel frame, J, substantially as herein shown and described, and for the purpose set forth.

4th, Pivoting or hinging the standards, D and F, to the cultivator frame, by means of the brace-ears, d' and f', substantially in the manner herein shown and described, and for the purpose set forth.

72,298.—AUTOMATIC RAIN CONDUCTOR.—James B. Hudson, Fayetteville, Pa.

I claim the cylinder, A, having a removable cover, B, and provided with a hopper, n, strainer, a, partition, E, pivoted disk, D, operated by float, F, and rod, R, and pipes, C P m and W, all constructed, arranged, and operating substantially as and for the purpose described.

72,299.—MACHINE FOR TRIMMING HEDGES AND CUTTING CORN.—John W. Hull, Connersville, Ind.

I claim, 1st, The combination of the frame, A, the hinged wheel, B, the cog-driving wheel, C, connected with gearing to move the horizontal shaft, c, and the vertical shaft, e, the rotating disk, G, with the hedge-cutting knives, h h, the forked guide, H, and the treadle, E, arranged and operating substantially as and for the purpose herein described.

2d, The combination of the main frame, A, the side frame, I I, the forked cornstalk cutter, K, the fixed arms, m m, the pivoted arms, m' m', and the treadle, E, arranged and operating as and for the purpose herein set forth.

72,300.—FOOT POWER.—Ezra Hutson, Brockport, N. Y.

I claim the rollers, d and e, ratchet, g, and pawls, m and n, the whole combined substantially as and for the purpose herein set forth,

72,301.—VEGETABLE CUTTER.—Enos B. Ives, Bristol, Conn.

I claim the wheel, E, provided with knives, g g g and e e e, substantially as described.

72,302.—DOOR BOLT.—C. C. Jones, Portland, Me.

I claim the combination of bolt, c, knob, e, and spring, f, in the case, a, with the plate, g, substantially as and for the purposes herein described.

72,303.—SLED.—George F. Krollpfeiffer, New York city.

I claim the attachment to sleds, sleighs, and other land conveyances, consisting of a pivoted frame, B, rod, E, and handles, F, substantially as and for the purpose described.

72,304.—HORSE HAY FORK.—Mary Jane Laird, Middletown, Pa., administratrix of the estate of Andrew J. Laird, deceased.

I claim the guard, D, when applied to hay forks for the protection of the lever or arm, substantially as described and set forth.

72,305.—PLOW.—S. J. Leach, Tuscaloosa, Ala.

I claim, 1st, Facing the mold-board of a plow with a thin detachable sheet or plate of wood, steel, or other suitable material, substantially as herein shown and described, and for the purpose set forth.

2d, Forming the mold-board, B, of a plow with a shoulder, b', and with slots or sockets, C, to receive the forward edge and tongues of the facing-plate, D, substantially as herein shown and described, and for the purpose set forth.

72,306.—LAMP CHIMNEY CLEANER.—George Leas, Shirleysburg, Pa.

I claim the lamp chimney cleaner, as described, the disk, B, of which is provided with a serrated metallic flange, as herein set forth.

72,307.—SEAT FOR VEHICLES.—John R. D. V. Linton, New Bedford, Mass.

I claim, as a new article of manufacture, a cast-metal seat riser, made substantially as herein shown and described.

72,308.—BEE HIVE.—Joel R. Martin, Martinsburg, Ind.

I claim, 1st, The block, G, connected to the end of the hive, A, and provided with its cleats, d d, pivoted as set forth, and for the purposes described.

2d, The combination of the hive, A, as constructed, with block, G, having cleats, d d, and supported by the standards, H H, above the pyramidal-shaped block, K, all constructed and used for the purposes set forth.

72,309.—PROTECTING STEAM BOILERS FROM CORROSION.—David Matthew, Prairie du Chien, Wis.

I claim a galvanic pile, which is composed of copper and zinc plates, or other metals equivalent in galvanic properties, applied upon a metal rod, which is provided on its ends with supporting disks, said pile being employed substantially in the manner and for the purposes described.

72,310.—CHURN.—James Maxey, Kewanna, Ind.

I claim the arrangement of the churn-body, A, standards, H H, shaft, I, wheels, G and F, and staff, B, provided with the wheel, D, and the paddles, C C, as and for the purpose set forth.

72,311.—TRACE FASTENER.—Ira C. McAllaster, Milo, Mich.

I claim the buckle constructed as described, consisting of the frame, E, having parallel side guards, F, and ear pieces, G, through which the rivets, H, pass, and slotted upon its upper side to receive the lever, M, hung by a slot, a, on a cross pin, b, upon which it slides, and provided with the tongue, L, at one end, its other end fitting upon the surface, P, of the buckle frame, as herein described, for the purpose specified.

72,312.—BACK-BAND FASTENER.—David L. McGregor, Charlestown, Mass.

I claim the metallic band-fastener, e, in combination with a saddle, substantially as described, and for the purpose set forth.

72,313.—SASH STOPPER.—J. N. McIntire, New York city.

I claim the catch or cam-like hook, so constructed and arranged as to interlock with and disengage from suitable pins or projecting stops in substantially the manner described, for the purposes set forth.

72,314.—WINDOW-SASH SUPPORTER.—John S. Merrill, Newtown, Md.

I claim the use of the self-acting metallic roller, D, in combination with the inclined metallic box, C, in the one side of the sash, and two friction rollers, E E, attached to the opposite side of the sash, when arranged, combined, and operating with the sash, as herein described and for the purposes set forth.

72,315.—HORSE RAKE.—Myron Miles, Middlesex, N. Y.

I claim the combination and arrangement of the hinged draw-bars, D D, guide standard, G, connecting rod, H, brace bars, M M, and stop, L, substantially as herein specified.

Also, the slots, m m, in the brace-bars, and the springs, c, in combination with the stop, L, for the purpose herein specified.

Also, the arrangement of the caster or carrier-wheels, N N, in combination with the rake, and with the draw-bars, D D, substantially as and for the purpose herein set forth.

72,316.—WASHING MACHINE.—Jehu Mitchell, Newark, O.

I claim the frame, L, hung by arms, H H, to bar, T, when provided with ribs, I I, and weight, F, in combination with the box, A, having standards, D, inclined bottom, O, and stationary ribs, M, all constructed, arranged, and operating as and for the purpose described.

72,317.—VENTILATOR FOR FLOUR MILLS.—Christopher Moegling, Milwaukee, Wis.

I claim, 1st, In connection with an ordinary open-top curb, the stops, i m, or n, or their equivalent, as and for the purposes set forth.

2d, The eductingpipe, D, when provided with the water stops, k k, or k', whether said pipe leads off from the curb, B, or from the receptacle, C, for the purposes specified, either with or without the aid of the wings, E.

3d, The vertically-adjustable frame, F, when used as and for the purposes specified.

72,318.—SEED PLANTER.—William R. Mozier, Higginsville, Ill.

I claim the combination of the trigger or hand lever, J, spring, L, lever, I, connecting bars, K and H, crank, G, recessed cylinder, F, and seed box, E, with each other and with the forward plow standard, B, plow beam, A, and handle, D, substantially as herein shown and described, and for the purpose set forth.

72,319.—PROPELLER.—Nicholas Nolan, New York city.

I claim the blades or paddles, D D, fitted in the rock frame, B, and operated from the driving shaft, K, through the medium of the crank wheel, J, and connecting rod, L, or their equivalents, in combination with the rod, M, attached to the crank, L, on the driving shaft, and provided with the hook, ix, and shoulder, j, to catch over pins, h h', the bevel segment, H, and the bevel wheel, G, on shaft, F, connected with the bar, E, all being arranged to operate in the manner substantially as and for the purpose set forth.

72,320.—SAIL-RELEASING APPARATUS.—Ferd. Gust Oehme, M. D., Plymouth, Mass.

I claim, 1st, Connecting the sail to the boat by means of an apparatus formed by the combination of inclined planes, spiral springs, and double-acting hooks, substantially as herein shown and described, and for the purpose set forth.

2d, The combination of the perforated grooved and slotted block, A, adjustable flanged blocks, E and G, springs, H, coiled spring or springs, B, pin, D, block, J, and hooks, K, with each other, substantially as herein shown and described, and for the purpose set forth.

72,321.—HORSE HAY-FORK.—Saml. Page, McAlisterville, Pa.

I claim the bar, C, having a slot at its upper end, through which is passed the lever, D, said bar being provided with the curved teeth, G G, and used in combination with the bars, B B, having pointed head, H, and tines, A A, all operating as specified.

72,322.—MODE OF TREATING SPONGE FOR PRODUCING TEXTILE FABRICS.—Alfred Paraf, Mulhouse, France.

I claim the herein described method of treating sponge to convert the same into fiber capable of being felted, spun, &c.

72,323.—LIFTING APPARATUS FOR GRAIN DRILL.—C. E. Patric, Macedon, N. Y.

I claim, 1st, The employment of the racks, R, and pinions, w, in connection with the hand-lever, F, and shaft, H, for the purposes set forth, whether the lifting-chains are made to wind upon the shaft or not.

2d, The arrangement of the locking-latch, D, with the shaft, H, when it is also made to act as a support, substantially as and for the purposes set forth.

3d, The arrangement of the guards, G, with the racks, R, and pinions, w, substantially in the manner herein shown and described, and for the purposes set forth.

72,324.—COMB.—William Pauly, College Point, N. Y.

I claim the combination of the two side-combs with the spring by which they are connected substantially as described.

72,325.—BELT-FASTENER.—C. O. Pike, North Leverett, Mass.

I claim, 1st, The half-collar, a, and the clamping-wedge, c, for fastening the ends of a bolt, constructed and operating substantially as described.

2d, The double levers, d d', constructed and operating as described, in combination with the above fastening device.

72,326.—PORTABLE EVAPORATOR.—H. L. Plumb, Hamer, O.

I claim the longitudinal partition, F, over the fire-chamber, as and for the purpose set forth.

The grate, J, constructed and operating in the manner shown and described.

The damper, arranged and operating in the manner shown and described.

Surrounding the fire-box of a portable evaporator with a jacket of sand or earth, substantially in the manner and for the purpose set forth.

In combination with the fire-box and evaporating-pan of a portable evaporator, the cover, I, secured in place by screws or clamps, and provided with pipes, b b, or their equivalents, for the purpose set forth.

72,327.—VISE.—H. K. Porter and T. W. Porter, Boston, Mass.

We claim, 1st, Controlling the sliding levers of vises by means of a spring, whose pressure may be varied at will by a screw inserted in the head of the vise-screw, substantially as set forth.

2d, The combination of the plunger, the spring, and set-screw, substantially as and for the purpose described.

72,328.—WASHING-MACHINE.—G. Reneky and J. Keiss, Cedar Falls, Iowa.

We claim, 1st, The vertical shaft, D, having vertical wings or flanges, E, rigidly attached to it, and perforated disk, C, having radial flanges, F, rigidly attached to it, said shaft and disk being rigidly connected together, in combination with the corrugated tub, A, substantially as herein shown and described, and for the purpose set forth.

2d, The combination of the crank, M, shaft, K, bevel-gear wheels, N and L, and cover, G with each other, with the winged or flanged shaft, D, and flanged disk, C, and with the corrugated tub, A, substantially as herein shown and described, and for the purpose set forth.

72,329.—HOISTING-JACK.—S. B. Rittenhouse, Plymouth, Ind.

I claim, 1st, The spring, g, secured between the sides of the box, A, and forming its front side, arranged in relation therewith, and with the pawl, f, as herein shown and described.

2d, The construction and arrangement of the box, A, spring, g, pawl, f, projection, B', upon hoisting-bar wheels, b, cog-shaft, C, shaft, D, and pinion, E, as herein set forth and for the purpose specified.

72,330.—BRICK MACHINE.—Wm. F. Shanks, Louisville, Ky

I claim, 1st, The combination of the parts, H H, Q Q, R R, uprights, P P, thumb-screws, N N, cross-pieces, J J, uprights, K K, and sliding plate, G, substantially as described, and for the purpose specified.

2d, In combination with the above, the rod, m, attached to the crank, B, belt, S, cogs, b, and rod, E, substantially as described, for the purpose specified.

3d, The sliding plate, G, operated by means of the cogs, D, and rod, E, substantially as described, for the purpose specified.

4th, The rollers, A A, adjusted by means of the cogs, b, and crank-wheel, B, whereby the thickness of the stream or column of mud is regulated, substantially as herein shown and described.

72,331.—WATER-WHEEL.—H. W. Shipley, Portland, Oregon.

I claim the combination and arrangement of the conical hub, F, and radial buckets, C C, when arranged at the bottom of the shaft, A, with the upper ring, r, constructed with exterior and interior flanges of the shape described, the lower ring, r, and the exterior buckets, D E E, forming a water-wheel which operates in the manner and for the purposes specified.

72,332.—INSIDE WINDOW-BLIND.—S. W. Shorey, Galesburg, Ill.

I claim, 1st, An inside window-blind, constructed, arranged, and operating substantially as herein shown and described.

2d, The combination of the frame, A, having the grooves, a, webbing, c, slats, D, frame, B, and hinges, C, as herein described, for the purpose specified.

3d, The combination of the adjustable frame B, with the grooved frame A, for closing and holding in a closed or partially closed position, the slats of a window blind, as herein shown and described.

72,333.—SEED PLANTER.—John Stark, Thomasville, Ga.

I claim, 1st, The arrangement of the vertical arbor, e, carrying revolving arms, j and l, respectively below and above the bottom of the seed box, substantially as herein shown and described.

2d, The frame F, of a seed planter, when hinged to a supporting frame A and when connected with the same by means of supports b b, all made and operating substantially as herein shown and described.

3d, The funnel-shaped lower part I, of the seed box, when secured to the frame F, in combination with the hopper J, secured to the frame A, all made and operating substantially as herein shown and described.

4th, The driving wheel C, of a seed planter, when connected by means of suitable rods or shafts with the revolving arbor e, having the arms j and l, all made and operating substantially as herein shown and described.

5th, The fertilizer box, when arranged substantially as herein shown and described, in combination with the seed box H, driving wheel C, and frames A and F, all made and operating substantially as herein shown and described.

6th, The arrangement and combination with each other of the plow N, tube r, shares O, flattener P, adjustable marker R, seed dropper J, shares S, and roller D, all made and operating substantially as herein shown and described.

72,334.—HARROW.—Nicholas Starr, Jr., Homer, N. Y.

I claim, 1st, Constructing a harrow of four sides, in two sections or divisions, and each division composed of two sides hinged together, and said divisions connected at the diagonal corners to form a single square harrow.

2, Also, the connecting or coupling rod c, with its bolts at either end, to connect such divisions together and keep the sides expanded.

72,335.—MANUFACTURE OF IRON.—David Stewart, Kittanning, Pa.

I claim purifying the pig-iron or blast-furnace metal from its carbon and other impurities by passing it in a stream through ozone, atmospheric air, or other oxygen-bearing gas or vapor, substantially as and for the purposes hereinbefore described.

72,336.—EXCAVATOR.—B. T. Stowell, Quincy, Ill.

I claim an excavating or ditching machine, constructed substantially as herein described, with cutters at each end, arranged to cut in either direction as the machine moves backward and forward, and which delivers the earth on to a common carrier or revolving apron, substantially as described.

72,337.—TIRE HEATER.—Harry Stroud, Jr., Clinton, Ill., assignor to himself and R. W. Robinson.

I claim the flues E E, and damper D, in combination with the lid B, and chamber A, the whole combined and operated substantially as and for the purpose set forth.

72,338.—CHURN.—Clark M. Terrall and Nathan W. Hussey, Oskaloosa, Iowa.

We claim the combination of the grooved base A, churn G, standard B, with button E', and lever C, provided with an adjustable metal plate D, for connecting the dasher E, the whole constructed, arranged, and operating in the manner as specified.

72,339.—BASE-BURNING STOVE.—Joel Tiffany, Albany, N. Y.

I claim the use or employment of downward streams or jets of hot air upon the surface of the burning fuel, in combination with lateral streams or jets of cold air, taken over the top, through the sides, or otherwise, of the fire pot, and specially directed or conducted, by means of tubes, projecting plates or other equivalent means, so as to meet the streams or jets of hot air, at the point of impingement upon the surface of the burning fuel, substantially as forth.

72,340.—PISTON-ROD PACKING.—Sidney S. Turner, Westboro, Mass.

I claim the tubular elastic packing, confined rigidly by its ends, so arranged as to be compressed laterally against the rod by the direct action of the steam or other medium of pressure, substantially as and for the purpose set forth.

72,341.—CLOTHES DRYER.—Joshua Walker, Kansas City, Mo.

I claim the frames A A' and B, the cord C, and sheave c, when combined and arranged as set forth.

72,342.—COOKING STOVE.—Geo. W. Walker, Boston, Mass.

I claim, in combination with a flame and smoke flue at the back of the oven, an oven-ventilating flue or flues, arranged to operate substantially as set forth.

Also a provision upon the oven door for swinging articles into and from the oven, and arranged to be folded out of the way when not in use, substantially as set forth.

Also, in combination with the fire pot and ash pit, the sifting chamber, provided with a sliding grate, substantially as set forth.

Also, in combination with such sliding grate, the opening at the end of the sifting chamber for obtaining access to the grate, in connection with a protecting wall or plate, substantially as described.

Also, in combination with such sifting grate, the scraper bar, to dislodge the coal when the grate is drawn out, substantially as set forth.

Also, the construction of the sifting grate with diagonal bars, substantially as and for the purpose set forth.

72,343.—TIDAL-WATER ELEVATOR.—Philip Weck, Brooklyn, N. Y.

I claim, 1st, The box F, and buoy J, in combination with the chain E, and weight G, toothed pulleys D D' H, ratchets K K', and pawls L L' P, all arranged to operate in the manner substantially as and for the purpose set forth.

2d, The pendant S, attached to the pawl L, in connection with the rods M R, which connect the pawls L L' P, to insure a simultaneous detachment of said pawls from their ratchets K K' O, and a simultaneous application thereto, substantially as and for the purpose specified.

3d, The float V, connected with the valve lever T, in box F, and arranged to operate in the manner substantially as and for the purpose set forth.

4th, The supplemental chain Ux, applied to the chain E, and buoy J, substantially as and for the purpose specified,

72,344.—PITMAN.—Thos. Welch, Churchville, N. Y.

I claim, 1st, A skeleton or shell pitman for harvesters, made of suitable cast metal, the skeleton or shell head to receive the crank-pin box being cast to and with the pitman, for the purposes set forth.

2d, The crank-pin boxes with spherical bearings, in combination with a pitman head having a suitable concavity, as and for the purpose specified.

3d, A set screw having a concaved end, when used with the pitman head and crank-pin box in harvesters, for the purposes set forth.

72,345.—MODE OF PROTECTING LIKENESSES IN MONUMENTS.—Isaac H. Wells, Pagetown, Ohio.

I claim, 1st, The elastic packing C c c1 c2 c3, applied and compressed between the several parts of the frame and the frame and stone, substantially as and for the purpose specified.

2d, The combination of the bars D, holes b4, screw d, back E, and flange b3, substantially as described.

3d, In combination with the frame B, the removable door or shutter F, for excluding light from the surface of the picture, when the same is constructed and applied substantially as set forth.

72,346.—BOX FOR PRESERVING CORPSES.—Peter Wendhiser, Rockville, Conn.

I claim the corpse table C, with the removable metallic cover E, having the opening F, when said table is supported upon legs, D and placed within the wooden box A, lined with the metallic lining B, and provided with the water-outlet pipes H, all constructed as described for the purpose specified.

72,347.—LOCKING-KNOB LATCH FOR DOORS.—Jacob Wertsbaugher, La Grange, Ind.

I claim, 1st, The curved dog G, constructed substantially as herein shown and described, in combination with the sliding frame D, as and for the purpose set forth.

2d, The hollow stem or tube J, having a slotted arm K, attached to or formed upon it, substantially as herein shown and described, and for the purpose set forth.

3d, The combination of the plate L, with its adjustable ward or wards, with the hollow stem J, and slotted arm K, substantially as herein shown and described, and for the purpose set forth.

72,348.—STEAM JET FOR CLEANING BOILER TUBES.—Joel M. Wheeler, Oxford, Conn.

I claim the head A, constructed with inclined slots or openings, substantially as herein shown and described, and for the purpose set forth.

72,349.—HARVESTER.—William N. Whiteley and Andrew Whiteley, Springfield, Ohio.

We claim, 1st, The combination of the spring t, or its equivalent, with a harvester's clutch lever, for the purpose specified.

2d, The combination of the adjustable piece p, with the rear end of the harvester's tongue, substantially as set forth.

3d, Attaching the draught bolt R, Fig. 3, by which the team draws the machine, to the outer side of the tongue (that next the uncut crop), to obtain the advantages stated.

4th, The combination of an adjustable draught point, by which the team draws the machine, and an adjustable driver's seat, and a detachable grain platform, in a harvester.

5th, The construction and connection of the main frame and driver's seat of a harvester in such a manner that this seat can be shifted from one to another of the herein-described places upon the frame, for the purpose stated.

6th, The platform B, or an equivalent thereof, constructed and connected to the finger bar and divider, in the manner and for the purpose set forth.

7th, The following arrangement of parts in a harvesting machine: The finger bar, substantially at right angles to its line of forward movement: the grain wheel, located so that some portion of its hub shall be in the same vertical plane with the finger bar; the finger bar further backward than the axle of the cutter's driving wheel; the grain wheel, placed so that its tread shall be as far inward as the point of the divider; a supporting metal plate, which always has a portion lower than the finger bar, and firmly secured thereto, while the divider and part of this plate are firmly connected by screw bolts.

8th, The adjustable guiding board K, constructed and connected to the divider, as shown and described, and for the purposes specified.

9th, Constructing and connecting a journal of a harvester's reel shaft to said shaft, substantially as described for the purposes specified, whether the reel pulley be made a part of this journal or not.

10th, In a harvester rake, the outer tooth of which moves over the platform faster than the inner tooth, and the points of the teeth faster than their other ends, connecting the inner end of the rake head to the main frame by means of a ball-and-socket joint, or its equivalent, the moving parts of which can always be kept in snug working order, as set forth.

11th, Making the post P, provided with a ball at its upper end, or an equivalent thereof, laterally adjustable, as and for the purpose described.

12th, Making the post P, provided with a ball at its upper end, or an equivalent thereof, vertically adjustable, as and for the purpose set forth.

13th, Placing the center of motion of a harvester's automatic rake at the front edge of the head of said rake, as and for the purposes set forth.

14th, Making the pitman by which a harvester's automatic rake is moved, when discharging the gavels from the platform, in two or more parts, and substantially as described.

15th, In combination with a harvester's automatic rake, which has the outer tooth moved over the platform faster than the inner tooth, and removes the gavels heads foremost, a guiding arch X, which is above the rake head, and further inward than the inner tooth, and by which said rake is raised up above the platform during its forward stroke.

16th, The arch X, constructed and combined with arch y, substantially as shown and described, for the purposes specified.

17th, The combination of a guiding arch X, and the rake carrier 3, or an equivalent thereof, with a harvester's automatic rake, which has the outer tooth moved over the platform faster than the inner tooth, and removes the gavels heads foremost.

18th, Combining with a harvester's automatic rake, which has its outer tooth moved over the platform faster than the inner tooth, and removes the gavels heads foremost, an arch, to carry the rake forward over the next gavel, when said device is provided with a latch which drops behind a part of the rake head as it passes backward, and compels said rake to come forward over the next gavel.

19th, The combination of the spring 8, carrier 3, and arch X, or an equivalent arrangement of parts, with a harvester's automatic rake that has the outer tooth moved over the platform faster than the inner tooth, and removes the gavels heads foremost for the purposes specified.

20th, Making the latch spring 8, adjustable, for the purposes specified,

21st, The combination of the adjustable gage plate 5, with the front portion of the arch X, for the purposes specified.

22d, The combination of the spring b, or an equivalent thereof, with a harvester's automatic rake, the outer end of which moves upon a center at the inner end, and is carried forward over the cut grain by means of the arch X, or an equivalent thereof.

23d, The rake projector 4, constructed as described, and connected with the head of a harvester's automatic rake, for the purposes specified.

24th, The raker's adjustable and removable foot board, constructed and

© 1868 SCIENTIFIC AMERICAN, INC.

connected to the main frame, substantially as shown and described, for the purposes specified.

25th, The adjustable raker's seat or stand 8', constructed and connected to the machine as shown and described, for the purposes specified.

72,350.—SPRING-BED BOTTOM.—George Widdicomb, Grand Rapids, Mich.

I claim the combination of the slats or long springs C, short springs, G, and blocks D, hinged to the blocks or bars E, by elastic hinges F, with each other and with the frame A B, substantially as herein shown and described, and for the purpose set forth.

72,351.—BOOT TREE.—F. S. Wilt, Allentown, Pa.

I claim, 1st, The bar E, the plates e f and g, constructed and arranged as described, in combination with the curved or convex surfaces c and d, for the purposes set forth.

2d, The slide J, and the lever h, arranged and operating as shown and described, in combination with the bar E, and plates f and g.

72,352.—BRICK FOR PAVEMENTS, ETC.—Robt. Wright, Philadelphia, Pa.

I claim a clay brick, having pieces of metal set into it, and coming to its surface, substantially as and for the purposes herein set forth.

72,353.—COFFEE POT.—John Zimmerman, Royalton Center, N. Y.

I claim the coffee pot above described, consisting of the boiler A, chamber D, strainer E, cover F, and tube G, bearing the chambers H and I, all arranged and combined substantially as and for the purpose specified.

72.354.—CULINARY BOILERS.—John Zimmerman, Royalton Center, N. Y.

I claim, 1st, The boiler A, having the central cone C, with perforated top, substantially as and for the purpose described.

2d. The detachable and foraminated bottomless vessels E G, substantially as and for the purpose described.

3d, The vessels Q S, substantially as described.

4th, The arrangement and combination of the boiler A, having the central cone C, with the cylinders D and F, or either of them, containing the bottomless vessels E G, and the inclosed cooking vessels, substantially as and for the purpose described.

72,355.—MANUFACTURE OF BASE BALLS.—Henry A. Alden, Matteawan, N. Y., assignor to New York Rubber Company.

I claim, 1st, a compound, formed of rubber mixed with the ingredients herein named, or their equivalents, in the proportion substantially as specified, which, when vulcanized, will have the hardness and elasticity required for base balls or other like articles, substantially as set forth.

2d, A base ball or other like article, made of the compound herein specified, the said compound being molded to the form required, and vulcanized, substantially as set forth.

72,356.—MANUFACTURE OF SMOKING TOBACCO.—Jonathan Ball, Elmira, N. Y.

I claim the mode herein specified of preparing smoking tobacco.

72,357.—APPARATUS FOR PREPARING PEAT.—Cyrus W. Baldwin, Boston, Mass.

I claim, 1st, The method herein described of effecting simultaneously the desiccation of peat, and its formation into bars or blocks, by subjecting the said peat to the action of centrifugal force, within a vessel constructed and operating substantially as shown and specified.

2d, The peat receiving vessel and diaphragm or partitions within the same, in combination with the bell, B, substantially as and for the purposes shown and specified.

72,358.—TRIPOD FOR SURVEYING INSTRUMENTS.—J. W. Barlow, U. S. Army.

I claim producing lateral adjustment on the tripod by means of the clamping plates or surfaces, B B, and the tightening screw, C, substantially as and for the purpose herein specified.

Also the central vertical aperture, d, through the adjusting screw and nut, and through the adjusting plate, for applying a plumb and line, substantially as set forth.

72,359.—WELL TUBE.—M. L. Bassett (assignor to himself and Egbert E. Pardee), West Haven, Conn.

I claim the arrangement described of the drip tube, F, and well tube, A, with the tube, B, when the said tube, B, is provided with a conical strainer or filter, E, substantially as herein set forth.

72,360.—DREDGE BOAT FOR EXCAVATING RIVERS.—Edwin L. Brady, New Orleans, La.

I claim, 1st, A dredging boat constructed with a series of water-tight compartments so proportioned and arranged that as they are filled with water the boat shall preserve an even keel, and the dredging mechanism be brought into action without any adjusting devices, substantially as set forth,

2d, The combination of the mud fan, A, attached to a rigid shaft, and a boat containing a series of water-tight compartments, E, so adjusted as to cause the boat to settle on an even keel, as the compartments are filled with water, and a pump, B, for exhausting the water from all the compartments, substantially as set forth.

72,361.—COMBINED LOW WATER INDICATOR AND SAFETY VALVE.—Charles Burley, Cincinnati, Ohio.

I claim, 1st, The safety valve, C'', affixed to a gravitating pipe, C C', which communicates with the water space, and is provided with a graduating lever F, in the manner and for the purpose set forth.

2d, the arrangement of bent tube. C C', and valve, C'', globe, D, bar, F, and adjustable weights, K, substantially as herein set forth.

72,362.—LOOM FOR CIRCULAR WEAVING.—John Buser, New York city.

I claim, 1st, A series of warp movers acting radially and moved by the mechanism shown, in combination with a shuttle revolved between the warp threads by the gearing, arranged and operating as set forth.

2d, The arms, e, in combination with the shafts, g1 g2, and disengaging mechanism for stopping the machine if a warp thread breaks, substantially as set forth.

3d, The bow, 19, applied in the shuttles, in combination with the disengaging mechanism, substantially as set forth.

72,363.—STEAM PUMP.—A. S. Cameron, New York city.

I claim, 1st. The guide rod, D, resting in a socket, F, in the seat of one valve, and extending through the seat of the other valve, and operating in combination with the valves, B B, substantially as set forth.

2d, The projection, H, on the inner surface of the lock nut, G, in combination with the case, A, guide rod, D, valves, B B, and valve seats, C C', substantially as and for the purpose described.

73,364.—BINDER FOR PAINT BRUSHS.—J. F. Canning, Boston, Mass.

I claim the binder, D, as made and applied, when coated with a mixture composed of shellac and mastic dissolved in alcohol, in the manner and for the purposes set forth.

72,365.—KNIFE.—N. W. Caughy, Baltimore, Md.

I claim as a new article of manufacture a knife constructed and arranged to operate substantially as herein shown and described.

72,366.—FINISHING WOOD.—Geo. Chambers, Ithaca, N. Y.

I claim the preparation made of the ingredients and colors and used substantially in the manner and for the purposes specified.

72,367.—SCHOOL DESK AND SEAT.—C. T. Chase, Albany, N.Y.

I claim the combination and arrangement of the standard, D, with the hinged seats, C C', horizontal bar, o, and desk, A, substantially as and for the purposes set forth.

72,368.—GLASS BOTTLE MOLD.—James. J. Christie, Baltimore, Md.

I claim, 1st, The movable panel or slide, E, used in combination with the mold, either upon its sides or bottom, and provided with suitable inscriptions, substantially as set forth.

2d, The bed plate, B, provided with the openings, a a, to allow of the escape of small particles of glass, substantially as herein set forth.

72,369.—IMPROVEMENT IN ORGANS, ETC.—B. O. Church and Hervey Smith, Brattleboro, Vt.

We claim the beveled piece, E, in combination with the levers, C, frame, B, and screw pins, a, forming a fulcrum for the levers, C, and holding them in place be means of the pins, k, substantially as shown and described.

72,370.—WAGON BRAKE.—B. R. Codwise, Montrose, Md.

I claim the combination and arrangement of the lever, K, with the tongue of a wagon, a ratchet or catch plate thereon, a sliding brake bar and brakes, operating against the front weeels of the wagon, and an intermediate crank, having suitable connecting rods, all substantially as and for the purpose herein set forth.

72,371.—MACHINE FOR ROUNDING CORNERS OF SLATE FRAMES.—Eleazar Coffin, Flicksville, Pa.

I claim, 1st, The pulley frame, B, belt, K, and spring, O, or equivalent, in combination with the mandrel, M, mounted on a swinging frame, N, and the operating key, R, or its equivalent, substantially as and for the purpose described.

2d, The swinging frame, N, carrying the cutter head, P, for the purpose substantially as described.

72,372.—NOZZLE FOR HOSE.—Mosely S. Curtis and Geo. W. Harris. New York city.

We claim the tongues, e, stems, b', and toothed sectors, c, in combination with the body, A, and the annular rack, m, of the shell, D, substantially as and for the purpose specified.

72,373.—BINDING BOOKS.—William Daniels, Brooklyn, N. Y.

I claim the strip of cloth applied to the fold of the central sheet of the section of a box, in combination with a long slot or opening in said sheet of paper at the fold, for the reception of the thread used in sewing the book, as specified.

72,374.—GRAIN AND STRAW SEPARATOR.—Levis H. Davis, Newark, Del., assignor to Castro & Co.

I claim the combination, substantially in the manner described, of the screens having a reciprocating, longitudinal, undulating motion, with the interposed center bar, having a rectilinear movement, for the purpose of thoroughly agitating and rapidly discharging the straw.

Also the notched reciprocating center bar, arranged and operating as described.

72,375.—SULKY PLOW.—Ireneus Donaldson, Toledo, Iowa.

I claim, 1st, In combination with the plow and carriage frame, the compound levers, I I', and casters. H H', placed in front and rear of the plow for regulating the cut, substantially in the manner set forth.

2d, In combination with the driver's seat, G, the oscillating arm, L, cord, K, and adjusting levers, I I'. arranged substantially as and for the purpose set forth.

72,376.—LAMP.—Levi F. Drake and Enoch Egginton, Portland, Me.

We claim, 1st, Making the cone with the ribs and small projections at the bottom, as and for the specified purposes.

2d, The chimney fitting over the cone when held on the same, as specified, and constructed with the grooves, as and for the purposes set forth.

72,377.—FRUIT DRYER.—Delectus Durfee, Fort Seneca, O.

I claim, 1st, The drawers, L L, arranged together within dovetailed grooves in the partition boards, C C', and connected by the pins, a, in their rear rails, as and for the purpose set forth.

2d, The grooved and hinged supporters, H, the drawers, L L, the stays, J, and arms, I I, arranged and used as and for the purpose set forth.

72,378.—PADLOCK.—Herman Eiffler, New York city.

I claim the lever stop, D, in combination with a series of loose tumblers, B, provided with hooks, c, and forming the bolt of a padlock, and loose false tumblers, B, situated as described, the tumblers being operated by a key through the opening a, in the side of the padlock, to open or lock the same, substantially as and for the purpose set forth.

73,379.—WARP FEEDING MECHANISM FOR LOOM.—Alfred B. Ely, Newton, Mass.

I claim, 1st, The feed rolls, E F, arranged as described, and operated directly from the lay, for the purpose set forth.

2d, The combination, substantially as described, of the yarn beam and lay with the rubber feed rolls actuated directly from the lay, for the purposes set forth.

72,380.—HEAD BLOCK FOR SAW MILL.—Charles R. Ely, Northfield, Vt.

I claim, 1st. In combination with the transverse gages of a saw mill, the position of which determines the thickness of the material cut from the stock, the pawls, k and k', when arranged to operate substantially as described.

2d, Also a rack bar carrying two or more inclines rigidly secured thereto, substantially as and for the purpose set forth.

3d, Also the plates constructed substantially as described, having a flange turned up in one direction on the inclined side, and a flange turned parallel with the rack bar on the straight side, and applied substantially as and for the purpose set forth.

4th, Also in combination with the pawls, k'. the detaining pawls, p, when constructed and arranged to operate in connection with inclines and gages, substantially as described.

5th, Also the combination of the pawls, k' k, their traversing bar, and their supporting lever, with the lever, h, and its indicating segment and pins, constructed and operating substantially as described.

6th, Also in combination with the transverse gages, the index finger and rotary scale, constructed and operating substantially as set forth.

72,381.—MACHINERY FOR TANNING.—Charles N. Farnam, Norwich, Conn.

I claim, 1st, The winding of ropes, F F', on drums, N N', one side winding over and the opposite side winding under the drums, thereby raising both sides of the frame, G, equally, substantially as shown and described.

2d, Arranging the shaft to which the motive power is applied, by the combination of wheel, L, and pinion, P, having a ratchet, p, and pawl, p', worked by a windlass N, all arranged so as to pass the posts, thereby avoiding interference in transition from vat to vat, as specified.

3d, The construction of the frame, G I I', having a shoulder to rest on sides of vat, with lower edge or ends, I, and movable bars, I', of the frame immersed in the liquor in the vat, when the frame is down, substantially as shown.

4th, Also the two forms of hooks, J J', one for ends of frame and one for movable bars, keeping the hides or skins at a suitable distance from each other, so that they will increase in thickness on exposure to the air when raised, and during the process of tanning; also allowing the hides or skins to drain when raised from the vats, thereby facilitating absorption, substantially as herein described and for the purpose specified.

72,382.—PEN HOLDER.—D. D. Foley, Washington, D. C.

I claim two pens so united or fastened together, back to back, in a holder socket, as to form a fountain or reservoir between the nibs or points, substantially as set forth.

72,383.—STEAM PUMP.—J. B. Gardiner and Edward H. Hyde, Springfield, Mass.

We claim, 1st, The arrangement of the valves, E and H, pistons, G G', ports, f and e, e' and i', y and z y', and z', substantially as herein set forth.

2d, The arrangement in connection with the said valve gear, of the valve rod, c, steam piston, A, plunger, B, and reservoir, C, substantially as set forth.

72,384.—OIL CAN.—J. B. Gayle, Raleigh, N. C.

I claim the rods, D D', with the packing as described, and used with the can A, and handle C', said rods being provided with cone-shaped top and coil spring, x, respectively, and operated in the manner substantially as and for the purposes described.

72,385.—STRAP FASTENING.—Rodmond Gibbons, San Francisco, Cal.

I claim the band fastening composed of the two plates or portions of plate confined together, one plate having a tooth or long spur, which projects down into or toward a groove in the opposite plate, substantially as shown and described.

72,386.—PLOW.—Andrew Gilmore, Phœnixville, Pa.

I claim, 1st, The cleaning blade, J, when constructed of two pieces, j j', attached together in such a manner as to render the blade adjustable in length.

2d, The adjustable frame, F, in combination with the wheel, W, and eccentric, G, when used in connection with a plow, substantially in the manner and for the purposes specified.

3d, The combination of the adjustable frame, F, wheel, W, eccetric, G, arm E, lever, H, pitman, I, and pivoted cleaning blade, J, when the latter is arranged to work on the left side of the coulter, C, substantially as and for the purpose specified.

4th, The adjustable handles, D D, when used in connection with a plow, substantially as and for the purpose specified.

72,387.—MACHINE FOR SQUEEZING PUDDLED BALLS OF IRON.—Samuel Gissinger, Lawrenceville, Pa.

I claim the corrugated jaws, A and B, constructed, arranged, and operating substantially as herein described and for the purpose set forth.

72,388.—MACHINE FOR SQUEEZING PUDDLED BALLS OF IRON.—Samuel Gissinger, Lawrenceville, Pa.

I claim squeezers constructed, arranged, and operating substantially as herein described and for the purpose set forth.

72,389.—COAL BORING BIT.—Samuel Gissinger, Manchester, Pa.

I claim the bit or cutter, A, provided with the entering point, B, scoring and cutting points, e and f, and guide, d, substantially as herein described and for the purposes set forth.

72,390.—COAL MINING MACHINE DRILL CARRIAGE.—Samuel Gissinger, Allegheny City, Pa.

I claim the drill carriage constructed as herein described, and provided with drill bars made operative through the medium of the wheels, w w1 w2 i h and g, arranged and operating in the manner and for the purpose set forth.

Also in combination with the above the screw, e, and the clamp screw nut, x, constructed, arranged, and operating substantially as herein described and for the purpose set forth.

72,391.—RAM FOR VESSEL.—William Hagerty, Monongahela. Pa.

I claim the releasing ram, D, provided with shafts, t, furnished with screw threads. o, said ram being made operative through the medium of the revolving nuts, e, the whole being constructed and arranged substantially as herein described, and for the purpose set forth.

72,392.—MACHINE FOR FEEDING NAIL PLATES.—Franz Hain, Gasconade County, Mo.

I claim, 1st, The support block, E. and adjusting piece, F, constructed and combined substantially as and for the purposes set forth.

2d, The holder, D, its boss, i, combined with the block, E, links, K1 K, arm, y, and lever, Y, when acting substantially as and for the purposes set forth.

3d, The combination of the adjusting piece, F, with the main frame at f, and with the guide-bar, f1, and set screw, f2, when acting substantially as and for the purposes set forth.

4th, The combination of the pawl, y, the wheel, y1, and lever, Y, substantially as and for the purposes set forth.

5th, The combination of the disk, G, pins, g, and arms, g1, and vertical shaft, g2, substantially as set forth.

72,393.—MACHINE FOR CUTTING AND WORKING FIBROUS SUBSTANCES.—Albert W. Hale, New York city.

I claim, 1st, The making the flanges on the rolls thicker and of greater diameter at the feeding end of the machine than they are at the delivery end thereof, and the making of such flanges to gear into or lap by each other more deeply at the feeding-end of the machine than they do at the delivery end.

2d, In combination with a machine for cutting or working soft and adhesive materials, operating substantially as described, the arrangement of a water chamber and distributing orifices, f f, substantially as and for the purposes set forth.

72,394.—TRACE FASTENER.—Benjamin J. Hartman, Wooster, assignor to himself and George Liggett, Jr., Wayne County, Ohio.

I claim the plate, D, as constructed, when used in combination with the tugs, A and C, and the keeper, F, substantially as and for the purpose set forth.

72,395.—ROCKING CHAIR.—Edson Hartwell, Hubbardston, Mass.

I claim, 1st, The combination with the frames into which the chair is divided, of the spiral springs, H, and toothed arms, D, arranged for operation in connection with the racks, G, as and for the purposes set forth.

2d, The combination with the springs, H H, and cross pieces, I and J, of the nuts, b b, c c, d d, and e e, substantially as and for the purposes set forth.

72,396.—ANIMAL TRAP.—Wm. Huntington, Howell, Mass.

I claim the arrangement and combination of the gated apertures, F G, and tilting platform, H, with the box compartments, C and D, the latter being lighted, and containing brine or other antiseptic liquid, substantially in the manner and for the purpose herein specified.

72,397.—ROAD LOCOMOTIVE.—E. C. James, Baltimore, Md.

I claim the combination of the open wheels, with a road wagon, to be driven by steam, or other equivalent motive power, when operating substantially as required.

72,398.—SPRING BED SLATS.—Platt C. Ingersoll, Greenpoint, N. Y.

I claim the springs, f and g, in combination with the sheet metal slat bars, B, and arranged in relation to the end and horizontal portions of said slat bars, substantially as and for the purposes specified.

72,399.—DITCHING MACHINE.—Henry C. Ingraham, Tecumseh, Mich.

I claim, 1st, The wheel, K, when constructed with parallel flanges, united only by bars, K', substantially as set forth.

2d, So connecting the driver's seat, Q, with the plough and frame, by means of the rods, O', that the weight of the driver, and mechanism behind the axle, shall counterbalance that placed in front of the axle, substantially in the manner set forth.

3d, The combination of the flanged wheel, K, with the belts, M and N, between which the earth is elevated, substantially as set forth.

4th, The combination of the plough, L, wings, L2, belts, M and N, and wheel, K, substantially as set forth.

5th, The combination of a flanged wheel, K, with bars, K', and intermediate open spaces, with the carrying belt, N, substantially as set forth.

6th, The combination of the lever, R, wheel, R', plough, L, lever, T, and rod, T', substantially as and for the purpose set forth.

7th, The combination of the plough with the guides, R2, substantially as set forth.

8th, In combination with the wheel, K, the adjustable extension slide, P, substantially as set forth.

9th, The combination of the notched frame, O, lever, O', pawl. S2, rod, S1 and foot lever, S, substantially as set forth.

10th, The combination of the lever, H, axle, G, ratchet wheel, I, and pawl, I', said parts being constructed substantially as and for the purpose set forth.

11th, In combination with the plough, L, the adjustable shoe, L1, substantially as and for the purpose set forth.

12th, The combination of the flanged wheel, K, belt, M, hinged arm, M2 pulley, M1, and spring, M4, arranged to operate substantially as set forth.

13th, So constructing the main frame that the wheels may, by folding the parts of the frame, be adjusted to a wider or narrower tread, substantially in the manner set forth.

72,400.—CUTTING TOOL.—Gustav L. Jaeger, New York city

I claim the combination of the slotted and shanked stock, A, guide frame with cutter, B, bearing, C, and screws, b c, all arranged substantially as set forth.

72,401.—SLED.—John Johnson. Boston, Mass.

I claim a sled, in which the top or seat, B, is secured, at or near its forward end, to the front cross bar by hinges, b and b', while its rear end is supported by means of a spring, c, when such is combined with a steering apparatus, as described, the whole being constructed, arranged, and operated in the manner and for the purposes set forth.

72,402.—FENCE.—John B. Johnson, Laurel, Ind.

I claim the mode of constructing the fence, and sustaining it by pins, C, at the top of the braces, so arranged, in relation to the other parts, that they will first yield to force of currents of water, and permit the panels and braces to swing freely in the stream on the pins by which they are attached to the ground posts, substantially as set forth.

72,403.—FASTENING WEARING APPAREL, SHOES, ETC.—Roswell Judson and William H. Lynch, Matteawan, N. Y.

We claim the herein described device for fastening wearing apparel and other like articles, the same consisting of a double jawed slide, cast or otherwise formed in one piece, an provided with perforations, c c, in the manner specified, so as to admit of two or more of said slides being connected together, as and for the purposes set forth.

72,404.—HORSE RAKE.—J. E. Kendall, Plymouth, Ind., assignor to J. E. Kendall, and Charles Whitmore.

I claim the hinged rake head, G G' G'', provided with teeth, J J, and connected to the bar, K, by the springs, M, as described, said rake head being connected to the sulky frame, and adjusted by the toothed bar, R, and cord N, passing over the pulley at the driver's seat, the whole constructed and operating substantially as described.

72,405.—CONSTRUCTING CAR WHEELS.—Cornelius Kingsland, McKeesport, Pa., assignor to himself and I. K. Morange.

I claim the method herein described for constructing car wheels.

72,406.—SCAFFOLD.—A. S. Skinner, Volga, Ind.

I claim the construction and arrangement of the frame, B B, diagonal braces, C C, plates, D D, rollers, d d, together with the sliding beams, E E, thimbles, e e, sheaves, f g c k, cord, a, gearing, h, pawl, n, ratchet, o, cranks, m x, and metallic shoes, w w, or their equivalents, when in combination, substantially as and for the purposes specified.

72,407.—CLOTHES WRINGER.—David Lyman, Middlefield, Conn.

I claim, 1st, In wringing or other like machines, having cog wheels on each end of the roller shafts, providing said cog wheels with flanges or circular plates upon their exterior faces, as herein described, so that while preventing the meshing of the cogs beyond a certain limit, they shall afford additional support and strength to said cogs, substantially as set forth.

2d, In wringing or other like machines, having flanged or disked cog wheels upon each end of the roller shaft, making all said disks or flanges with equal diameters, so that when the disks or flanges of the continuous cog wheels are in contact, they shall move with a rolling in contradistinction to a sliding friction, as and for the purposes set forth.

72,408.—PERMUTATION LOCK.—Isaac W. Lamb, Salem, Mich.

I claim, 1st, The combination of the spindle, D, the pin or pins, e e, and key, n', with the wheels, C, when constructed and operated substantially upon the principle described.

2d, Also, producing the various combinations. by placing the wheels, C, in the lock in different order, substantially as specified.

3d, Also, the combination of the spring, F, with the pin wheel, E, as and for the purpose herein explained.

4th, Also, splitting the screw, g, at g', for the purpose specified.

72,409.—MODE OF COUPLING SHELLS TO ROLLERS.—J. M. Mason, New Albany, Ind., assignor to himself, Oscar T. Higgins, Charles E. Wilson, and Samuel Adlam, Jr.

I claim, 1st, The shell, B, coupled to the roller, A, by means of the dovetailed tongue, z, fitting into the groove, x, all being constructed substantially in the manner and used as and for the purposes set forth.

2d, Utilizing the old roller by means of the shell, when connected together substantially as specified.

72,410.—INSTRUMENT FOR EXPANDING FINGER RINGS.—Lewellyn Mason, Rochester, N. Y.

I claim, 1st, The improved instrument for stretching finger rings, constructed, arranged, and operating substantially as herein set forth.

2d, The combination, with the expanding shaft, B, and the core, C, of the scale, 1 2 3, etc, arranged substantially as described.

72,411.—GRADING AND DITCHING MACHINE.—Arthur A. Maxwell, Pratt, Ohio.

I claim the frames, A E, ploughs, B B, inclined plane, C, belts, D F, wheels, R S, band, T, and truck, N, with crank shaft, W, the whole arranged and combined with their respective devices for operating in the manner substantially as and for the purposes specified.

72,412.—MANUFACTURE OF ARTIFICIAL STONE.—David McCaine and William McCaine (assignors to themselves and Daniel McCaine), Groton, Mass.

We claim an artificial stone, made of materials and in the manner substantially as described.

72,413.—BOILER FEED REGULATOR.—William McCormick, Philadelphia, Pa.

I claim, 1st, The combination of the rod. H, with the whistle, K, supply cock, D, float, G, and index, F, substantially as described.

2d, The slot, c, of the rod, H, in combination with the pin. f, arm, d, of the whistle, K, and arm, G, of the cock, D, substantially as described.

72,414.—BURNER FOR HYDROCARBON FLUIDS.—Rufus S. Merrill, Boston, assignor to himself and William Carleton, Charlestown, Mass.

I claim, 1st, A burner for hydrocarbon fluids, in which the base or lower portion, when provided with a cap which covers or incloses the apertures leading to the fluid reservoir, is combined with the deflector and chimney holder of the said burner mounted upon the wick tube, substantially in the manner herein set forth, and for the purposes specified.

2d, The combination with the wick tube and capped or covered base of the burner, of the chimney holder, deflector, and sleeve, fitting upon said wick tube at a point above said covered base, under the arrangement herein shown and described.

3d, The combination with the wick tube, and the sleeve which carries the deflector and chimney holder, of the friction spring, for holding said sleeve upon the tube, substantially as set forth.

72,415.—GAS BURNER.—George Mooney, Providence, R. I.

I claim the combination of screw, C, with the base or pillar of a common argand, or other burner, with the cup, E, arranged with the opening, D, for the purposes specified.

72,416.—FAN BLOWER.—Nathan Parrish, Kalamazoo, Mich.

I claim, 1st, The pendulum fan, C, vibrating with the rock shaft, B, in close proximity with the stationary sides and bottom of the triangular case, A, in combination with the inlet and outlet valves, c and d, arranged and operating substantially as and for the purpose set forth.

2d, The triangular case, A, provided with the inlet and outlet valves, c c d d1, in combination with the vibrating fan, C, rock shaft, B, and its operating levers, and the air-box or receiver, D, the whole constructed and arranged in the manner and for the purpose set forth.

72,417.—STIRRUP.—Elizur Pond, New Haven, Conn.

I claim a stirrup, consisting of the metal shell, a, provided with an eye, A and the lining b, the whole constructed substantially as herein set forth.

72,418.—BONE AND PLASTER MILL.—Samuel W. Powell, Brookville, Md.

I claim, 1st, The clearers or discharging devices. f, applied within a space S, enclosed by the shells, C B, of a crushing machine, substantially as and for the purpose described.

2d, Applying the clearers, f', to a toothed ring, C', which is supported within the annular space, S, and driven by means substantially as described.

3d The reversible perforated case, or division, C, applied to a machine operating substantially as described.

4th, The construction of the cover, A, with a central, elevated, hollow enlargement, A1, forming a chair for receiving a vertically adjustable journal-box, which supports the upper end of the spindle, D, substantially as described.

5th, The arrangement, within a perforated case, C, of one or more revolving arms, carrying removable and reversible square-faced hammers, d, substantially in the manner and for the purpose described.

6th, The vertically adjustable journal box, b1, supported upon a chair formed on cover, A1, and adapted for receiving the tapering end, C', of the spindle, D, substantially in the manner and for the purpose described.

7th, The step, h, constructed with perforations in it, substantially as described.

8th, The construction of the oil cup, L, for receiving the step, h, and with a journal box, L', for receiving the foot piece, g, substantially as described.

72,419.—APPARATUS FOR FUMIGATING PLANTS.—C. C. Preston, Bayland, Texas.

I claim, 1st, A combination of the retort, A, with the flexible tube, F, substantially as described.

2d, The combination of the retort, A, tube, F, and bellows, C, substantially as and for the purpose described.

3d, The combination of the retort, A, tube, F, bellows, C, and carriage, substantially as described.

72,420.—DEVICE FOR EJECTING HOT WATER ON WAR VESSELS.—Abbott Q. Ross, Cleves, Ohio.

I claim, 1st, The combination of the boiler, A, condensing pipe, b', and the flexible hose pipes, c and c', connected therewith, arranged in a war vessel substantially as and for the purpose described.

2d, In combination with the boiler, A, and the pipe, b', the revolving pipe, d, with nozzle capable of being elevated and depressed by the means and for the purpose substantially as described.

3d, In combination with the boilers and revolving pipe, as described, the revolving turret, substantially as and for the purpose set forth.

4th, In combination with the revolving, swivel jointed pipe, d, the spreader, s, with lever, l, for operating the same, substantially as and for the purpose set forth.

72,421.—BRICK MACHINE.—Wm. Sangster, Joliet, Ill., assignor to himself, James Floyd Michael Kero, Wm. P. Dellman, John Smith and George Stuffler.

I claim a brick machine, consisting of the case, A, having shaft, B, arms, a

© 1868 SCIENTIFIC AMERICAN, INC.

and slotted bottom, D, arranged with the slotted plates, E, with their rollers, H, for the vertical adjustment of the mold frame, F, provided with its knives, I I, all constructed and operating as and for the purposes set forth.

72,422.—MANUFACTURE OF CORRUGATED BELLS.—George S. Saxton St. Louis, Mo.

I claim the bell, A, when it is formed in corrugations, substantially in the manner and for the purpose set forth.

72,423.—MACHINE FOR FILLING HORSE COLLARS.—August Schrick and Henry Hildenbrand (assignors to themselves, F. C. Krayer and C. R. Schrick), St. Louis, Mo.

We claim, 1st, the scraper or scrapers, f f I, and their combination with the rock shaft, f4, substantially as and for the purpose set forth.

2d, The combination of the rotating shaft, H, and its prongs, h, with the rock shaft, I, and its prong, i, substantially as set forth.

3d, The eccentric bar, G, the shaft, i4, and the shaft, H, when combined and acting substantially as and for the purposes set forth.

4th, The combination of the eccentric bar, G, with the shaft, substantially as and for the purposes set forth.

5th, The arrangement of the partition piece, K, in the hopper, F, substantially as and for the purposes set forth.

72,424.—WAGON SEAT.—Jacob Sebastian, New York city.

I claim the spring arms, B, links, a, and spring slides, D, in combination with the seat, A, and uprights, C, substantially as and for the purpose described.

Also, the loops, b, and screws, c, in combination with the uprights, C, spring slides, D, arms, B, and seat, A, constructed and operating substantially as and for the purpose set forth.

72,425.—WAGON SPRING.—Jacob Sebastian (assignor to himself and Lewis Saal), New York city.

I claim, 1st, A clamp, A, composed of cross bars, a b, keys, c, and wedges, d, to act in combination with the clips, D, substantially as and for the purpose described.

2d, Providing the edges of the leaves of the spring with grooves or notches, to admit the edges of the keys, c, substantially as and for the purpose described.

3d, Providing the spring, at one or both ends, with an oblong eye, substantially as and for the purpose described.

72,426.—STEAM BLOWER.—L. F. Smith, Philadelphia, Pa.

I claim, 1st, The spreader, E, constructed and arranged within the pipe, A, with its partitions, B B, in the manner and for the purpose set forth.

2d, In combination with the spreader, E, in the pipe, A, with its partitions, the solid pipe or casting, D, having orifices, e e', and screw thread, all constructed and operating as specified.

72,427.—GAGE FOR SETTING WAGON AXLES.—David F. Stratton, Christiansburg, Ohio.

I claim a reversible gage for the purpose set forth, having on one side the adjustable standard, B, fixed standard, C, and adjustable swing, D, and on the other the longitudinally adjustable standard, B', fixed standard, G, and vertically adjustable standard, H, when constructed to operate substantially as described.

72,428.—ARTIFICIAL PLATE FOR TEETH.—Leander R. Streeter, Chelsea, assignor to Alfred B. Ely, Newton, Mass., trustee.

I claim, 1st, The use of hard resins, or resinous bodies, mixed with fibrous or textile materials, and shaped by means of heat and pressure, substantially as described.

2d, The use of thin plates of metal, horn, shell, gutta percha, wood, or other suitable material, capable of being pressed into shape, between or in combination with layers of resinous and fibrous compound, as and for the purposes substantially as described.

3d, Also, as a base for artificial teeth or gums, the use of fibre or fibrous material, saturated or mixed with lac, or other suitable substance, which, when heated and pressed, will assume the proper shape, and possess or acquire the proper hardness and elasticity, substantially as described.

72,429.—COFFEE MAKER.—J. Warren Thyng, Salem, Mass.

I claim the conical distributing chamber, f, arranged under the condenser, substantially as and for the purpose herein specified.

Also, the inverted perforated cone, i, in the bottom of the receptacle, B, in combination with the distributing chamber, f, substantially as and for the purpose specified.

Also, the extended flange, m, on the receptacle, for the purpose specified.

Also, the combination of the condenser, A, constructed substantially as described, with the receptacle, B, constructed substantially as set forth.

72,430.—TONGUE-SUPPORT FOR RAILROAD STREET CARS.—John M. Fiernan, Pittsburg Pa.

I claim the mode of supporting the tongues of street-cars and other vehicles or machines, while the same are being moved from place to place, or changed from one end of a car to the other, by the use of a curved or bent metallic bar or rod, attached to or swung under the tongue, together with the mode of operating the said bar by a lever fastened thereto acting against a bolt fixed to the tongue over the said bar, as the same is herein above described.

72,431.—MANUFACTURE OF LIQUIDS FOR MAKING ICE, AND FOR OTHER PURPOSES.—Pieter Hend. Vander Weyde, Philadelphia, Pa.

I claim, 1st, The manufacture of hydride of propyle or chimogene, from the so-called non-condensable gases escaping from any petroleum-still, by condensing them in a coil exposed to a freezing mixture, or by submitting them to a powerful pressure of a pump, or by both.

2d, The boiling of crude or refined petroleum at the common temperature by the suction of a vacuum, agitating it, and condensing the vapors produced by cold or pressure, or by both, thus producing a highly volatile liquid, boiling at about 30° Fahrenheit, and corresponding with hydride of ethyle.

3d, The application of these liquefied gases, or of gasoline, or any other very volatile product of petroleum, to the making of ice and of cooling in general.

4th, The temporary preservation of dead bodies by the perfectly dry cold produced by placing in the coffin one or more long, narrow cylinders filled with the above described liquefied hydrocarbon gases, or with liquefied sulphurous acid, carbonic acid, or nitrous oxide, or their equivalents, from which cylinders the gas is slowly escaping, regulated by a stop-cock, and thus maintaining any desired low temperature, the escaping gas at the same time serving as a preservative and disinfectant.

5, The use of the above described or other products of petroleum, or the use of crude petroleum, when escaping, either by their own pressure, or projected, as a spray, by the atomizing action of a blast of air, oxygen or nitrous oxide, for an illuminating and heating agent, either under a steam-boiler using petroleum, in combination with a blast of air or steam, or both, as above described, or for a lime-light or blow-pipe, requiring only two very small vessels, each containing one of the liquefied gases—petroleum gas and nitrous oxide gas—as substitutes for the non-condensable hydrogen and oxygen.

72,432.—TAKING THE FORM AND MEASURE OF GENTLEMEN TO CUT COATS AND VESTS.—Theodore Vandoren, Sr., Washington, D. C.

I claim the use of a series of jackets, with the seams thereof formed as herein described, in combination with the patterns, to correspond with said jackets, when said jackets and patterns are used together in the manner described, as a system for cutting gentlemen's coats and vests, herein fully set forth.

72,433.—DIVIDER.—O. E. Weatherhead, Winchendon, Mass.

I claim the device for holding a pencil, point, or pen upon the dividers, consisting of the elbow, C, piece, E, with groove, c, and clamp, F, with set-screw, b, arranged and combined substantially as described.

72,434.—BREECH-LOADING FIRE-ARM.—D. B. Wesson, Springfield, Mass., assignor to the Wesson Fire-Arms Company.

I claim the slide, D, pushing-bar or bars, m, and studs, b', arranged in relation with each other, and with the extractor, C, and pivoted bar, E, substantially as and for the purpose specified.

72,435.—PEN-HOLDER.—H. F. Wheeler, Boston, Mass.

I claim a pen-holder, having sockets for two pens, substantially as described.

72,436.—BORING-TOOL.—Albert Wippo, Chicago, Ill.

I claim the above described tool for shaping the ends of the legs of furniture, constructed to operate substantially in the manner and for the purpose set forth.

72,437.—STOVE-PIPE DAMPER.—G. B. Wiseman, Sycamore, Ill.

I claim a damper, B, provided with a sliding rod which has a cylindrical and two or more rectangular portions, constructed substantially as and operating in the manner set forth.

72,438.—LAND ROLLER.—Wm. S. Worley, Tuscolia, Ill.

I claim the rollers, B B', provided with the bands, C C C, and shovels, b b, when arranged upon the frame, A, in the manner and operating substantially as and for the purposes herein specified.

REISSUES.

56,879, dated August 7, 1866; reissue 2,811.—TWEER.—John Bayliss, New York city.

I claim a tweer, A, having a water chamber, B, provided with connecting water and steam pipes, D and E, in combination with the air pipe, G, air chamber, I, and air pipe, J, arranged together and operating substantially as and for the purpose represented and described.

49,354, dated August 8, 1865; reissue 2,812.—HORSE HOE CULTIVATOR.—R. B. Dunn and John C. Flint (assignees by mesne assignments of Albion Webb), Bangor, Me.

We claim, 1st, Securing the share to a plate in such manner as to be readily removed therefrom or secured thereto, substantially as described.

2d, The employment of teeth or cogs as a means of adjustment, and holding in position a movable blade, substantially as described.

3d, Providing a wing or blade, and the part to which it is connected, with a rib in one and a series of notches or grooves in the other, to set and hold the blade in position.

4th, In combination with such rib and notches, a bolt and nut, or their equivalents, to loosen and tighten the same, as described.

5th, Supporting the forward ends of the share-supporting plate by means of screw-threaded rods entering screw-threaded eyes on the plate, to admit of lowering or raising the share, substantially as shown and described.

6th, Providing the cross bars with slots, or their equivalents, as and for the purpose described.

7th, Providing the cross bars with notches to receive the eyes of the loops, which secure the share-supporting rods in the desired positions.

8th, The curved support, D, made of a single block, when constructed and applied as and for the purposes described.

59,588, dated November 13, 1866; reissue 2,813.—CHIMNEY HOLDER FOR GAS BURNERS.—Elliott P. Gleason, New York city.

I claim, 1st, The plate or strip forming the spring, f, bent and curved substantially as described.

2d, The spring, f, riveted to the arm, n, substantially as set forth.

3d, The equalizing spring for chimney holders, constructed substantially as set forth.

20,959, dated July 20, 1858; reissue 2,814.—RAILWAY SWITCH.—Mariette Smith, Ithaca, N. Y., assignee by mesne assignment of George R. Smith.

I claim, 1st, The described rack and pinion at the base of a perpendicular rotating or partially rotating shaft, when combined with a spring lever and a circle or segment of a circle, said lever being fixed at right angles to the said shaft, and playing on said circle or segment, and into slots in the same, and said segment or circle being horizontal.

2d, Also, the above-named combination, when further combined with a signal lantern, which lantern revolves wholly or in part when adjusted to the top of said shaft, said lantern having different-colored glasses, and revolving on an axis drawn perpendicularly through the center of said lantern.

3d, Also, when in connection with a railroad switch and adapted thereunto, the construction and arrangement of the shaft, a a, the hand lever, h, and the segment or circle, g g, as described.

4th, The arrangement and adaptation of the segment or circle, hand lever and shaft just named, to its frame, holding up the shaft, a a, so that the shaft and hand lever shall revolve together, and the segment or circle be fixed or stationary about the shaft, as described.

5th, The construction of the segment, g g, with slots to receive the lever, h, at the places or points requisite for the switch changes, as described.

6th, The construction of the hand lever, h, so as to be self or readily operated by its spring at the just-named places or points of switch changes in the said segment, as described.

7th, The combination, with the shaft, a a, hand lever, h, and segment or circle, g g, of the rack and pinion, b c, and rod, e e, and changeable track or tracks, as described.

57,006, dated August 7, 1866; reissue 2,815.—HYDRAULIC MAINS OF GAS WORKS.—I. N. Stanley, Brooklyn, N. Y.

I claim as an improvement in hydraulic mains for gas works, the combination with the main, C, of the external supply tubes, D, cast with or made separately from and attached to the main, and communicating with the same below the water or fluid therein, substantially as and for the purpose herein set forth.

62,084, dated February 12, 1867; reissue 2,816.—WASH BOILER.—M. W. Staples, Catskskill, N. Y.

I claim, 1st, In combination with a portable wash boiler, having a perforated partition or diaphragm, E, made as described, one or more tubes or conduits, D, arranged and operating substantially as hereinbefore set forth.

2d, Also, the water space or chamber, B, in a portable wash boiler, provided with a perforated partition, E, made as described, and conduits, D, made and operating in the manner and for the purposes hereinbefore set forth.

64,163, dated April 23, 1867; reissue 2,817.—HORSE HAY FORK.—A. R. Sprout, Hughesville, Pa.

I claim, 1st, Providing the extreme penetrating point or points of a horse hay fork with a cutting edge or edges for cutting its way into the hay, said points being so constructed that they can be operated so as to catch and hold in the hay for elevating it and be released at will from the hay for discharging it.

2d, The coniform points, f and g, provided with cutting edges, and shoulders and hooks, 6 and 7, constructed, arranged, and operating substantially as herein described and for the purpose set forth.

54,431, dated May 1, 1866; reissue 2,818.—HORSE HAY FORK.—Ariel B. Sprout, Picture Rocks, Pa.

I claim, 1st, Combining in one implement a hay elevator and hay cutter, so constructed that, when used as an elevator, it will cut its way into the hay, and so operating that it will catch in the hay for elevating it, and then may be released at will from its hold in the hay for discharging it, substantially as described.

2d, The combination and arrangement of the bars, A and B, provided with barbs and cutting edges at their lower extremities, and levers, n and w, substantially as herein described, and for the purpose set forth.

DESIGNS.

2,848.—WINDOW FASTENER.—G. B. Kirkham, N. Y. city.

2,849.—PAPER COLLAR.—Wm. F. Moseley, Brooklyn, N. Y.

2,850.—OIL-CLOTH PATTERN.—James Patterson, Elizabeth City, N. J., assignor to W. W. Gearn & Co., Newburg, N. Y.

PENDING APPLICATIONS FOR REISSUES.

Application has been made to the Commissioner of Patents for the Reissue of the following Patents, with new claims as subjoined. Parties who desire to oppose the grant of any of these reissues should immediately address MUNN & CO., *37 Park Row, N. Y.*

26,808.—MANUFACTURE OF BOOTS AND SHOES.—William N. Ely, Stratford, Conn., assignee by mesne assignments of Francis D. Ballou Abingdon, Mass. Dated Jan. 10, 1860. Application for reissue received and filed Dec. 5, 1867.

I claim attaching by sewing mechanism the welt sole or welt strip of leather etc., to the upper of boots and shoes, substantially as described.

199 (whole No. 31,203).—SEWING MACHINE.—Willian N. Ely Stratford, Conn., assignee by mesne assignments of F. D. Ballou, Abingdon, Mass. Dated Jan. 22, 1861. Application for reissue received and filed Dec. 5, 1867.

1st, I claim attaching the soles of boots and shoes by sewing them to welts or taps, or their equivalents, by sewing machinery, substantially as described.

2d, Cutting away the table, A, or part where the work is to be supported and the needle to operate so as to present the work to the needle with greater facility for stitching the shanks of shoes or concave lines of work etc., near the edges thereof, substantially as described.

3d, Raising or projecting upward a lip or standard, c, above the adjacent parts of the machine for the purpose of supporting the arcicle at the point of sewing, substantially as described.

4th, Interposing a guard or guard plate between the needle or awl or both and the upper or raised part of the leather, substantially as described.

5th, The adjustable foot, C, when used as a guard or gage, or both, substantially as described.

6th, The lip or standard, c, when used as a guard or gage or support, or all of them, substantially as described.

7th, The moving surface, E, for aiding the forward movement of the work in combination with a feeding mechanism, substantially as described.

8th, The opener, G or G', substantially as and for the purposes described.

9th, The presser, D, in combination with the adjustable foot pieces, C or C', or both, substantially as described.

10th, The curved bearing plate, B, and lip or standard, C, in combination with the presser bar, substantially as and for the purposes set forth.

11th, The projecting curved horizontal table plate, A, constructed and arranged substantially as and for the purposes described.

12th, The open throat between B and E, when arranged substantially as described and for the purposes set forth.

13th, The projecting curved perpendicular plate, B, with standard, c, substantially as and for the purposes described.

20,134.—LAMP.—William N. Ely, Stratford, Conn., assignee by mesne assignments of L. Bailey, Charlestown, and R. Thayer, Boston, Mass. Dated May 4th, 1858. Application for reissue received and filed Dec. 6, 1867.

1st, I claim suspending the body of the lamp within an outer case so arranged that the air shall pass within the case and around the lamp body to the flame, substantially as described.

2d, A hollow lamp case, pedestal and base, constructed and arranged in relation to the lamp body, substantially as described.

3d, An annular lamp body in combination with an outer case, substantially as described.

4th, Constructing and arranging the parts so as to deflect the air coming up from outside the lamp body toward the flame, substantially as described.

5th, Supplying air to the flame by means of the channel formed between the body of the lamp and the outside shell or case, substantially as described.

6th, Arranging and using the rod or wire, K, in relation to the flame and hollow pedestal and case, substantially as and for the purposes described

7th, The concavo convex button constructed and arranged substantially as and for the purpose described.

28,568.—MACHINE FOR WEIGHING AND BAGGING GRAIN.—Harriet M. Fish, New York city, assignee of L. K. Plimpton and Wm. Fowt, Buffalo, N. Y., executors of James M. Fish, deceased. Dated June 5, 1860. Application for reissue received and filed Nov. 7, 1867.

What is claimed as the invention of said James Fish is, 1st, in combination with a weighing scale a grain bin fitted with a sloping bottom or sides, a bagging spout and gate to regulate the flow of grain, substantially as described.

2d, The use of a grain bin fitted with a sloping bottom or sides a bagging spout and gate to regulate the flow of grain substantially as described for the purpose of facilitating the bagging and weighing thereof, suostantially as described.

3d, The arrangement of the bin, A, doubly-inclined floor, O, vertical gates, D, spouts, L, frame, B, and scale, M, the whole being constructed and combined substantially in the manner and for the purposes explained.

59,466.—SCHOOL DESK AND SEAT.—Calvin W. Sherwood, Chicago, Ill. Dated Nov. 6, 1866. Application for reissue received and filed Dec. 9, 1867. Div. A.

1st, I claim the joint composed of the nave, C', and axle, B', constructed and operating substantially as set forth.

2d, The arrangement and combination of the arms, C, nave, C', and axle, B', with the seat, D, and standard, A, substantially as specified.

3d, The double-acting stop, K, constructed and operating substantially as specified.

4th, So locating and arranging the stop, k, and axle, B', on the head, B, that with the nave, C', a covered and compact joint is provided, substantially as and for the purposes specified.

5th, The double-acting stop, k, in combination with the shoulder, l, operating in the slot or space, substantially as specified.

59,466.—SCHOOL DESK AND SEAT.—Calvin W. Sherwood, Chicago, Ill. Dated Nov. 6, 1866. Application for reissue received and filed Dec. 9, 1867. Div. B.

1st, I claim the jointed braces, F, when provided with lips, a, and ledges, b, substantially as and for the purposes specified.

2d, The combination and arrangement of the ledges, b, lips, a, and pins, d, with the braces, F, and hinged shelf, K, substantially as specified.

3d, The arrangement and combination of the hinged arms, H, jointed braces, F, and hinged arms, G, with the standards, A, and desk top, I J, substantially as and for the purposes specified.

54,135.—WATCH.—S. D. Engle, Hazleton, Pa. Dated April 24, 1866. Application for reissue received and filed Dec. 7, 1867.

1st, I claim the employment of a box or supplemental case, B, to receive the movement of a watch secured in the external or principal case of the watch by means of studs or pins and a groove or by other suitable means for the purpose herein set forth.

2d, I claim the cup, h, with its flange, h2, and washer, i, arranged with the key hole, g, in the manner and for the purpose herein described.

53,195.—LUBRICATOR FOR STEAM ENGINES.—John Storer, New York city. Dated March 13, 1866. Application for reissue received and filed Dec. 10, 1867.

I claim in a lubricator for steam engines a movable cap or valve and a screw or clutch to secure the cap or valve in position (when so arranged that the screw or cluth can turn without carrying the valve or cap round with it) in combination with a soft metal ring for making a joint between the valve or cap and the body of the lubricator, all substantially as and for the purpose specified.

☞ NOTE.—*The above claims for Reissue are now pending before the Patent Office and will not be officially passed upon until the expiration of* 30 *days from the date of filing the application. All persons who desire to oppose the grant of any of these claims should make immediate application.* MUNN & CO., *Solicitors of Patents, 37 Park Row, N. Y.*

Advertisements.

The value of the SCIENTIFIC AMERICAN *as an advertising medium cannot be over-estimated. Its circulation is ten times greater than that of any similar journal now published. It goes into all the States and Territories, and is read in all the principal libraries and reading rooms of the world. We invite the attention of those who wish to make their business known to the annexed rates. A business man wants something more than to see his advertisement in a printed newspaper. He wants circulation. If it is worth* 25 *cents per line to advertise in a paper of three thousand circulation, it is worth* $2.50 *per line to advertise in one of thirty thousand.*

RATES OF ADVERTISING.

Back Page.....$1.00 *a line.*

Inside Page.....75 *cents a line.*

Engravings may head advertisements at the same rate per line, by measurement, as the letter press.

$10 A Day for all. Stencil tool, samples free. Address A. J. FULLAM, Springfield, Vt.

MOLDING CUTTERS Made to Order.—Send for circular to WM. H. BROWN, 44 Exchange st., Worcester, Mass. 1 eow10*

Vises! Vises! Vises!

THE UNION VISE CO., of Boston, Mass., make Vises of all kinds for heavy or light work. Their Pipe Vises, with and without extra jaw, are equal to the heaviest kind of piper's work. Send for price list. For sale by dealers in hardware. 1 5—D.

ENGINE LATHES, A Specialty, from new patterns of superior style and workmanship. Machinist's Tools generally. Cor. 15th st. and Pennsylvania Ave., Phila., Pa. HARRINGTON & HASKINS. 1 13

NOTICE.---To

"ALL MEN WHO USE PLANE IRONS."

We hereby authorize all "Hardware Dealers" to allow their customers to try our "Clover-Leaf Plane Irons," and, if not *perfectly suited*, take them back, refund price paid, and charge irons over to us.

We want Mechanics and Dealers to Run no Risk in Buying our Plane Irons.

See that our TRADE MARK Is on each Iron.

REYNOLDS, BARBER & CO.,
Steel Tempering Works,
1 13eow] Auburn, N. Y.

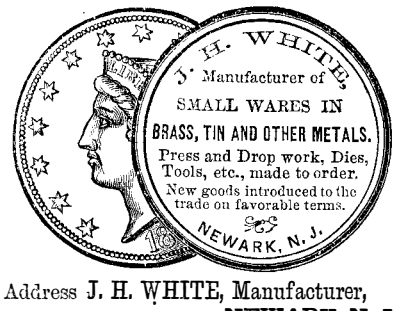
PATENT
Water Proof Roofing,
BELTING & HARNESS PAPER,
Send Stamp for Circular and Sample of the Paper.
C. J. FAY & CO.,
21 & Vine Sts., Camden, N. Jersey.
1 3is—1, 5, 10

TO CAPITALISTS.—Phelps's Patent Strainer Faucet, a most valuable invention. Europe for sale cheap. For particulars address JOHN PHELPS, Owego, Tioga county, N. Y., where they are manufactured. 1*

A BUSINESS TO GET RICH.—Wanted to a new Patent Manufactory—Feather Flowers—a Partner with Capital. Also, to rent, the use of this patent. T. E. SCHMIDT, 1* Hoboken, N. J.

500 AGENTS WANTED TO SELL HOWE'S BITTERS warranted to cure Malignant Agues, Excruciating Sciatica, Terrible Debility. Also, HOWE'S SIRUP.—Cures Horrid Cancers, all Blood, Liver, and Skin Diseases. Price $1 per bottle. Good Agents make $20 per day, or 100 per cent. For particulars address
1 3 C. B. HOWE, Proprietor, Seneca Falls, N. Y.

Metal Back Advertising Cards,
A new and attractive mode of advertising any kind of business, Patent Medicine, etc.


J. H. WHITE,
Manufacturer of
SMALL WARES IN
BRASS, TIN AND OTHER METALS.
Press and Drop work, Dies, Tools, etc., made to order.
New goods introduced to the trade on favorable terms.
NEWARK, N. J.

Address J. H. WHITE, Manufacturer,
NEWARK, N. J.

JENNINGS'S REVERSIBLE SPRING Bed Bottom. Simple, Cheap, Efficient, Noiseless, Durable.
"The rich man's spring for comfort, the poor man's for economy."—Rev. W. M. Richards, Berlin City, Wis.
For Rights, address S. C. JENNINGS, Wautoma, Wis.

POWER PUNCHES AND SHEARS; Power Rotary Shears; Power Straightener; Vertical Drills, etc. Address GREENLEAF & CO., 1 tf Indianapolis, Ind.

ALCOTT'S CONCENTRIC LATHES.—For Broom, Hoe, and Rake Handles, Chair Rounds, etc., and all other kinds of Wood-working Machinery, for sale by S. C. HILLS, 12 Platt st., New York 1 tf a

A NEW VOLUME.—Look out for the January Pictorial Double Number of the ILLUSTRATED PHRENOLOGICAL JOURNAL, with portraits of Kings, Queens, and Emperors; also of Patrick Henry, Edward Everett, F. W. Robertson, and others; including "Signs of Character; Races of Men; Science of the Soul; Social Relations, Love, Courtship, and Marriage; Education and Self-Improvement; Choice of Pursuits, with other matters all ought to know, to be found in no other publication. Only $3 a year, or 30 cents a number. Address S. R. Wells, No. 389 Broadway, New York. 1 2

AGENT WANTED IN EACH COUNTY.
Highest Premium at Great Fair American Institute, 1867.
Brown's Combined Carpet-Stretcher and Tack-Driver Stretches and Tacks Carpets simultaneously, without stooping, bruised fingers, side aches or lame backs. Uses any kind of tack. Brown's Tack-Drawer accompanies the Driver. Send stamp for circulars. G. E. HARDING, 726 B'way, N. Y.
"Operated with as little effort as the subsequent sweeping of the carpet. The Tack-Drawer extracts the tacks as easily."—*Sci. American.*
"Putting down Carpets becomes a light and elegant amusement, besides saving the labor of one person."—*N. Y. Tribune.*

FOR SALE—A Toy Steam Engine, price $16, cost $50. Just the thing for a Holiday Present Address Box 597, Gloucester, Mass.

AMERICAN TWIST DRILL CO., North Blackstone, Mass., formerly of Lowell, manufacture and offer for sale all sizes Twist Drills. P. O. address Woonsocket, R. I.

Iron Bridge Builders

ARE HEREWITH INVITED TO OFFER Plans and Propo als, of the most approved patterns for an IRON DRAW BRIDGE of 180 feet in length, across the Milwaukee River, at the foot of Huron st., in the City of Milwaukee, and all parties who are desirous to make such offer are hereby notified that the undersigned will receive such plans and proposals at his Office until the 8th day of January, on which day the same will be submitted to the Joint Committee on Bridges for their opinion FREDRICK WILMANNS,
1 2 Controller City of Milwaukee.

© 1868 SCIENTIFIC AMERICAN, INC.

HYDRAULIC Jacks and Punches, Improved. Manufactured by E. LYON, 470 Grand st., New York. Send for a circular. 1 eow13*

PRICE REDUCED.—For the pitiful sum of $2, I will send Dever's recipe for the cure of Leaky Steam Boilers. Costs but a trifle and never fails to stop the worst leak.
A. BELCHAMBERS, Ripley, Ohio.

AGENTS WANTED—For three New Articles of Manufacture of daily consumption; great chance for small capitalists. Address, with stamp,
1 tf JAS. L. ROUTZAHN, Frederick City, Md.

W. M. REYNOLDS, Tin and Stove Dealer, Newman, Ga., will act as agent for the sale of all Manufactured Articles or Patented Inventions sent to him, freight paid, on moderate terms. tf

PORTABLE RAILROAD.—The advantages of the Patented Portable Railroad are manifold. It saves time and money; is particularly adapted for excavating, filling, constructing railroad beds, milldams, levees, etc.; working in mines, quarries, brick yards, and peat bogs. Sold or rented in 20-foot sections, from one to a thousand. Also, Cars suitable for the work to be done. Contracts for excavations, etc., promptly attended to. For particulars or pamphlet, address A. PETELER & CO., New Brighton, Richmond Co., N. Y. 1 3*

$100 IN CASH, Offered to GOOD MEN who will act as AGENTS for the
"Banner of Light,"
And seven other new inventions. $150 per month, pay, sure. Address A. B. CLARKE & CO. Pittsburgh, Pa.

PATENT RIGHT FOR SALE.—A Combination Tool, embracing four different useful implements; easily made, and large margin. Address Box 827, Worcester, Mass. 1*—D.

PATENT POWER AND FOOT-PUNCHING PRESSES, the best in market, manufactured by N. C. STILES, Middletown, Conn. Cutting and Stamping Dies made to order. Send for Circulars. 11*tf

BUERK'S WATCHMAN'S TIME DETECTOR.—Important for all large Corporations and Manufacturing concerns—capable of controlling with the utmost accuracy the motion of a watchman or patrolman, as the same reaches different stations of his beat. Send for a Circular. J. E. BUERK,
P. O. Box 1,057, Boston, Mass.
N. B.—This detector is covered by two U. S. patents. Parties using or selling these instruments without authority from me will be dealt with according to law. 1*

FOR SALE—Mineral Land—Missouri Pine and Mineral Land. For sale, my one-third interest in a tract of 4,000 acres, with two Steam Saw Mills and Lead Mines now in course of development. Send for description and map. THOS. ALLEN, 722 South Fourth street, St. Louis, Missouri. 1*

THE AMERICAN TURBINE WATER WHEEL, Patented by Stout, Mills, and Temple, possesses new and valuable improvements, and remedies defects which exist in all other Turbine wheels. Per cent of power guaranteed to be equal to any overshot wheel. For descriptive circulars address OLIVER & CO.,
1* Agents, 55 Liberty street, New York.

BABCOCK & WILCOX'S PATENT STATIONARY STEAM ENGINES,
from 25 to 1,000 horse-power, built in the best manner and at the shortest notice by the
South Brooklyn Steam Engine & Boiler Works
Imlay, Summit, and Van Brunt sts., Brooklyn, N. Y.
☞ Over 4,000 horse-power of these engines are now running and contracted for.
1* D. McLEOD, Proprietor.

ALLEN'S PATENT Anti-Lamina for preventing and Removing the Scale from Steam Boilers, can be used at any time while the Engine is working. For particulars address ALLEN & NEEDLES,
1 3] 41 South Water street, Philadelphia.

L. D. FAY, MANUFACTURER OF MACHINISTS' TOOLS, WOOD-TURNING LATHES etc., from new and improved patterns. Gauge Lathes for turning hoe and broom handles or beaded work. Lath Chucks, largest assortment to be found in New England, Manufactory Worcester, Mass. 1 eowtf

To Stove Manufacturers

A RARE OPPORTUNITY TO SECURE the State Right of Mueller's Heat-Radiating Stove Door Knobs for the States of Penn. and Ohio. Patented Sept. 25, 1866, and illustrated in the Scientific American Jan. 25, 1867. Address J. B. HANNIMANN, Detroit, Mich., owner and manufacturer of Mueller's Heat-Radiating Stove-Door Handles and Cover Lifters. One of the testimonials:—Detroit, Oct. 14, 1867. J. B. Hannimann, Dear Sir:—After applying your patent door knobs to several varieties of stoves manufactured by us during the present season, we cheerfully testify to their adaptation to the purpose, their utility, and the general satisfaction they give to all using them. Respectfully yours,
H. I. FISK, Secretary Detroit Stove Works.

FOOTE'S PATENT.—The First and Only Invention for Threading and Setting the Sewing-Machine Needle, which enables all, especially those whose eyes have suffered from working on black clothes and threads of the same color, to thread and set the needle with the greatest ease and rapidity. We having just completed an arrangement with M. B. Foote, which makes us the Sole Agents of the United States, are prepared to fill all orders. Agents of Sewing Machines will find it to their advantage to secure the agency for their territory, as we make a liberal discount to them and the trade. The threader and setter combined, sent prepaid to any address upon the receipt of $1.
MUMFORD & CO., Agents,
1 2* 70 Asylum st., Hartford, Conn.

ANTI-INCRUSTATION, OR BOILER Powder of H. N. WINANS, 11 Wall st., New York, removes old scale and prevents new deposits. 12 years' use proves it efficient and uninjurious. 1*

TO PATENTEES AND OTHERS.—J. H WHITE, 157 Chestnut st., Newark, N. J., Manufacturer of all descriptions of Brass Work, Small Wares, in Tin and other Metals. Press and Drop Work, Metal Spinning Dies, Tools, Castings, etc. 1*

PLATINUM—For all Laboratory and Manufacturing purposes. Platinum Scrap and Ore Purchased. H. M. RAYNOR, Office 748 B'dway, N.Y. 1 eow5*

PRACTICAL SCIENTIFIC BOOKS on Engineering, Architecture, Surveying, Military, Civil and Mining, Building Monuments and Decorations.
ATCHLEY & CO., 106 Great Russel st., London.
23, 1, 3, 5 os]

HOISTING APPARATUS FOR MINES, etc., with our Patent Friction Clutches attached with a variety of sizes of Drums and Geering, manufactured by VOLNEY W. MASON,
24 & 26*] Providence, R. I.

PARTIES PREPARED TO FURNISH Galvanized Castings, also, Wood tubs for Ice-cream Freezers in quantities will please send their address to
1 2 CHAS. GOOCH, Cincinnati, Ohio.

NOTICE.—Parties having new and meritorious inventions for mining and quarrying purposes can hear of a desirable local and traveling agent by addressing, K. B., No. 97 Commerce street, Newark, N. J.

WANTED—A Second-hand, No. 2, Medium Wright's Scroll Saw. Address
D. STEVENS, Box 45, Danbury, Conn.,
Stating price and condition of Machine. 1 2*

OLMSTEAD'S IMPROVED OILER.
ALWAYS RIGHT SIDE UP!!
The most durable Oiler made.
It cannot be injured by falling, or the spring "set" by use. Sold everywhere. Address for circular,
J. H. WHITE, Sole Manufacturer,
Newark, N. J. 1*

P.S. PRICE LIST OF STUBS' FILES, PLYERS, CUTting Nippers, Hand Vises, Steel Wire, etc.; Twist Drills and Chucks: Drawing Instruments, Steel Letters and Figures sent to any address.
GOODNOW & WIGHTMAN,
1 4 23 Cornhill, Boston, Mass.

"BENEDICT'S TIME," for this Month. Timetables of all Railroad and Steamboat lines from New York, with City Map, 25c., sent by mail.
BENEDICT BROS., Jewelers, 171 Broadway.
BENEDICT BROS., up town, 691 Broadway.
BENEDICT BROS., Brooklyn, 334 Fulton st. 1 tf

UNION PACIFIC RAILROAD CO.

NOTICE.

THE COUPONS OF
THE FIRST MORTGAGE BONDS
OF THE
Union Pacific R. R. Co.,
DUE JAN. 1st., 1868,
Will be Paid on and after that Date,
IN GOLD COIN,
FREE OF GOVERNMENT TAX,
At the Company's Office, No. 20 Nassau street, New York.
1 2 JOHN J. CISCO, Treasurer.

LABORATORY OF INDUSTRIAL CHEmistry. Advices consultations on chemistry applied to arts and manufactures, etc. Informations on chemical fabrications, plans of factories, drawings of apparatus, analyses and assays of every kind. Address Prof. H. Dussauce, Chemist, New Lebanon, N. Y.

BRADLEY'S GAMES.—Instead of spending your money for Toys that amuse for a day, buy your children Games that are always new. Buy any of
BRADLEY'S GAMES,
And you will be sure of something interesting and GENERALLY INSTRUCTIVE.
All dealers have them. Send stamp for Catalogue to
1 3 MILTON BRADLEY & CO., Publishers, Springfield, Mass.

$500 GIVEN TO ANY ONE WHO will successfully cut or pick the "Yankee Pocket." The best, simplest, lightest, and most convenient Safeguard against Pickpockets in existance. Attached to any coat or vest in two minutes, weighs 2½ oz. For cut and description see No. 1, Vol. XVIII., of Scientific American. RIGHTS FOR SALE. AGENTS WANTED. Sample Pocket, with Pocketbook, mailed free for $2. For particulars enclose stamp to T. S. LAMBORN, Marshallton Chester county, Pa. 1 4

VINEGAR FABRICATION. — Prof. H. Dussauce, Chemist, is ready to furnish the most recent methods of making vinegar by slow and quick processes, with or without alcohol, directly from corn or other grains. Also, process for making acetic acid by distillation of wood. Address, New Lebanon, N. Y.

New, Important Books
FOR PRACTICAL MEN.

GLEANINGS FROM ORNAMENTAL ART, in Every Style, Drawn from Examples in the British, South Kensington, Indian, Crystal Palace, and other Museums, the Exhibitions of 1851 and 1862, and the best English and foreign works. In a series of 100 exquisitely engraved plates, containing many hundred examples. By Robert Newbury.....8vo. $15

LIST OF STYLES—Savage Tribes, Egyptian, Assyrian, Greek, Etruscan, Pompeian, Roman, Byzantine, Arabian, and Saracenic, Persian, Turkish, Indian, Hindoo, Chinese, Anglo Saxon, and Celtic, Mediæval, Gothic, Renaissance, Italian and Cinque-Cento, Elizabethan, Louis Quatorze.
☞ This superb volume is invaluable for workers on metal and stone jewelry, engravers, painters, decorators, fresco painters, cabinet makers, frame makers, gilders, etc., etc., and is recommended by the publisher without hesitation to all who have occasion for ornamental designs.

PARKS AND PLEASURE GROUNDS; or, Practical Notes on Country Residences, Villas, Public Parks, and Gardens. By Chas. J. Smith, Landscape Gardener and Garden Architect.....12mo. $2

A MANUAL OF DYEING RECIPES For general use. By James Napier, F.C.S., with numerous patterns of dyed cloth and silk.....12mo. $3 75

LECTURES ON COAL-TAR COLORS, and on Recent Improvements and Progress in Dyeing and Calico Printing, embodying copious notes taken at the last London International Exhibition, and illustrated with numerous patterns of aniline and other colors. By Dr. F. C. Calvert, F.R.S., F.C.S., Professor of Chemistry at the Royal Institute, Manchester. 8vo, cloth, $150

SCREW-CUTTING TABLES FOR THE use of Mechanical Engineers; showing the proper arrangement of wheels for cutting the threads of screws of any required pitch, with a table for making the universal gas pipe threads and taps. By W. A. Martin, Engineer. Second edition, oblong.....8vo, cloth. 50

A MANUAL OF ELECTRICITY, PRACTICAL AND THEORETICAL. By F. C. Bakewell, second edition, revised and enlarged. Illustrated by numerous engravings.....12mo. $2

PRACTICE OF PHOTOGRAPHY. By Robert Hunt, F.R.S., Vice-president of the Photographic Society of London. With numerous illustrations. 12mo..... 75

RECORDS OF MINING AND METALLURGY; or Facts and Memoranda for the use of the mine agent and smelter. By I. Arthur Phillips, and John Darlington. 12mo. Illustrated..... $2
CONTENTS: Mining and metallurgy, historical notice, hydraulic machinery, steam machinery, steam boilers, superheated steam, crushing and dressing machinery, assaying, recent metallurgic processes, boring, mining as an investment, joint stock companies' act, 1816, mining economics, copper ore statistics, miscellaneous rules and tables, joint stock companies, act of 1857.

THE PRACTICE OF HAND-TURNING in Wood, Ivory, Shell, etc., with Instructions for turning such works in metal as may be required in the practice of turning in wood, ivory, etc., and an appendix on ornamental turning. By Francis Campin. Illustrated. 12mo..... $3

PRACTICAL HYDRAULICS. a Series of Rules and Tables for the Use of Engineers, etc. By Thomas Box. 12mo, cloth..... $2

☞ The above, or any of my books sent by mail free of postage, at the publication price.
☞ My new Catalogue of October 1, 1867, sent free of postage to any one favoring me with his address.
HENRY CAREY BAIRD,
Industrial Publisher.
1 3] 406 Walnut street, Philadelphia.

MERCHANTS should Read The Phrenological Journal to learn how to select trusty clerks.

E. A. BAGLEY & CO., Manufacture Round and Square Head Set and Cap Screws turned from the bar, and of extra quality, and case-hardened to order, and used in the construction of all kinds of machinery. Orders solicited. Send for price list and circular. E. A. BAGLEY & CO.,
1 2*] Worcester, Mass.

525 MILES
OF THE
Union Pacific Railroad
Running West from Omaha
ACROSS THE CONTINENT,
ARE NOW COMPLETED.

This brings the line to the Eastern base of the Rocky Mountains, and it is expected that the track will be laid thirty miles further, to Evans Pass, the highest point on the road, by January. The maximum grade from the foot of the mountains to the summit is but eighty feet to the mile, while that of many eastern roads is over one hundred. Work in the rock cuttings on the western slope will continue through the winter, and there is now no reason to doubt that the entire grand line to the Pacific will be open for business in 1870.

The means provided for the construction of this Great National Work are ample. The United States grants its Six Per Cent Bonds at the rate of from $16,000 to $48,000 per mile, for which it takes a *second lien* as security, and receives payment to a large if not to the full extent of its claim in services. These Bonds are issued as each twenty mile section is finished, and after it has been examined by United States Commissioners and pronounced to be in all respects a first-class road, thoroughly supplied with depots, repair shops, stations, and all the necessary rolling stock and other equipments.

The United States also makes a donation of 12,800 acres of land to the mile, which will be a source of large revenue to the Company. Much of this land in the Platte Valley is among the most fertile in the world, and other large portions are covered with heavy pine forests and abound in coal of the best quality.

The Company is also authorized to issue its own First Mortgage Bonds to an amount equal to the issue of the Government and no more. Hon. E. D. Morgan and Hon. Oakes Amesare Trustees for the Bondholders, and deliver the Bonds to the Company only as the work progresses, so that they always represent an actual and productive value.

The authorized capital of the Company is One Hundred Million Dollars, of which over five millions have been paid in upon the work already done.

EARNINGS OF THE COMPANY.

At present, the profits of the Company are derived only from its local traffic, but this is already much more than sufficient to pay the interest on all the Bonds the Company can issue, if not another mile were built. It is not doubted that when the road is completed the through traffic of the only line connecting the Atlantic and Pacific States will be large beyond precedent, and, as there will be no competition, it can always be done at profitable rates.

It will be noticed that the Union Pacific Railroad is, in fact, a *Government Work*, built under the supervision of Government officers, and, to a large extent, with Government money, and that its bonds are issued under Government direction. It is believed that no similar security is so carefully guarded, and certainly no other is based upon a larger or more valuable property. As the Company's

FIRST MORTGAGE BONDS

are offered for the present at **90 CENTS ON THE DOLLAR,** they are the cheapest security in the market, being more than 15 per cent lower than U. S. Stocks. They pay

SIX PER CENT IN GOLD,

or over **NINE PER CENT** upon the investment. Subscriptions will be received in New York at the Company's Office, No. 20 Nassau street, and by
CONTINENTAL NATIONAL BANK, No. 7 Nassau st.,
CLARK, DODGE & CO., Bankers, No. 51 Wall st.
JOHN J. CISCO & SON, Bankers, No. 33 Wall st.,
and by the Company's advertised Agents throughout the United States. Remittances should be made in drafts or other funds par in New York, and the bonds will be sent free of charge by return express.

A New Pamphlet and Map, showing the Progress of the Work, Resources for Construction, and Value of Bonds, may be obtained at the Company's Offices, or of its advertised Agents, or will be sent free on application.

JOHN J. CISCO, Treasurer.
New York, Nov. 23d, 1867. 1 1

YOUR SON would be greatly benefitted by reading The Phrenological Journal. He would learn how to make the most of himself. $3 a year.

OIL! OIL!! OIL!!!
FIRST PREMIUM.....PARIS, 1867.
EXPOSITION UNIVERSELLE!
PEASE'S IMPROVED OILS!
Acknowledged the Best in the World! The Highest Award over all others!
Grand Silver Medal and Diploma!
The **Only One** to the United States awarded to
F. S. PEASE,
For the Greatest Excellence in Oils for Lubricating and Burning.

London,.....1862.
WORLD'S FAIR—TWO PRIZE MEDALS
Awarded to **F. S. PEASE** for Improved Engine, Saguai, Lard, and Premium Petroleum, as the **Best made!**

These Improved Oils cost no more than many of the common oils in market, while they are endorsed by the greatest experience and highest authority in the United States and Europe, and offered to the public upon the most thorough, reliable, and practical tests as the Best Oils made for
Railroads, Steamers, and for Machinery and Burning.
F. S. PEASE, Oil Manufacturer,
Nos. 61 and 63 Main street, Buffalo, N. Y.
N B.—Reliable orders filled for any part of the world. 1 tf

LE COUNT'S PATENT
HOLLOW LATHE DOGS, MACHINIST AND BOILER MAKERS' CLAMPS.
Are as Strong as Steel. Light and Neat. At a Low Price.
Send for Circular to
C. W. LECOUNT,
1 tf South Norwalk, Conn.

FARMERS should read THE PHRENOLOGICAL JOURNAL, and be posted on the "Progress and Improvements" making in moral, intellectual, and social science. Only $3 a year. Send stamp for premium lists to S. R. WELLS, 389 Broadway, New York.

FOR BRASS LATHES and all Machinery connected with Brass Finishing and Fitting Line. Improved Lathes for making large valves, etc. Address Exeter Machine Works, Exeter, N. H. 24 tf

MASON'S PATENT FRICTION CLUTCHES, for starting Machinery, especially Heavy Machinery, without sudden shock or jar, are manufactured by VOLNEY W. MASON,
1 1*tf Providence, R. I.

SEND FOR A DESCRIPTIVE CATALOGUE of
Shaw & Justice's
DEAD STROKE POWER HAMMER,
Manufactured and for sale by PHILIP S. JUSTICE,
42 Cliff st., New York, or 14 North 5th st. Philadelphia,

LUCIUS W. POND,
Iron and Wood Tools,
And Machinery,
TURBINE WATER WHEELS.
Works at Worcester, Mass.
Sale Rooms 85 Liberty st., (2 doors West of Broadway), New York. 1 tf

DOUGLASS' PATENT SELF-FEED Friction Hand Drill. The simplest and best in use. Send for illustrated Circular.
1 3 HUTCHINSON & LAURENCE, 8 Dey st.

PLANER AND MATCHER for $350, a good, new machine. S. C. HILLS, 12 Platt st. N. Y.

THE PHRENOLOGICAL JOURNAL for December contains 17 portraits of distinguished men with their biographies:—Geo. Peabody, President Woolsey, Elias Howe, Oliver Cromwell, Rev. Drs. Worcester Giles, Silver, Hibbard, Stuart, Ager, Hayden, and others. The Sultan of Turkey, and a Glance at his Empire; Our Social Relations; the late Paris Exposition; Unmarried; What shall we do with Old Maids? History of the New Jerusalem, or Swedenborgian Church; Saints and Sinners; and much other instructive matter. End of Vol. 46. A new volume begins with the next number. Now is the time to subscribe—only $3 a year. Address
25 2] S. R. WELLS, 389 Broadway, New York.

AMERICAN EMERY.

ARROWSIC EMERY, Manufactured at Bath, Me. All numbers from fourup to one hundred and twenty. The only real mine in the world, excepting in Turkey. For sale in quantities to suit, at reduced prices, by STANWOOD, McLELLAN & FULLER,
24 Central street, Boston.

From Stanly Rule and Level Co., New Britain, Conn.
"We have been using some numbers of your Emery on steel, and it gives good satisfaction. If it proves to work as on trial, thus far, we shall use nothing else. For some reason, London emery does not give us good satisfaction on steel.

Bristol, Conn.:
Our men, who work by the job, say your Emery is better than any English or American Emery they ever used.

Mackintosh Hemphill Co., Pittsburgh, Pa.:
The quality of your Emery Cloth is excellent. 1 5*

PRATT, WHITNEY & CO.,
HARTFORD, CONN.
Make Hand and Engine Lathes, Crank and Gear Planers, Drills, Screw and Milling Machines, Water Motors, etc., unsurpassed for nice construction, strength, durability, and convenience. 1 9tf

THE FUEL SAVING FURNACE CO.,
No. 205 BROADWAY N. Y.
1 tf

EMPLOYMENT! $10 a day and Expenses paid. Circulars free. O. T. GAREY, Biddeford, Me.

LENOIR GAS ENGINES, From half-Horse to three Horse-power, for sale at COMPANY'S OFFICE, No. 26 Pine st., Room 8, New York. 1 21*

FOR SALE—Very superior upright Drills, New Friction Feed, materials and workmanship first class. Send for cut
1tf BULLARD & PARSONS, Hartford, Conn

TODD & RAFFERTY, Manufacturers and DEALERS IN MACHINERY.
Works, Paterson, N. J.; Warerooms, 4 Dey st., New York.
Steam Engines and Boilers, Steam Pumps, Machinists' Tools. Also, Flax, Hemp, Tow, and Rope Machinery; Snow's and Judson's Governors, Second-hand Machinery.

BABCOCK & WILCOX'S PATENT STATIONARY STEAM ENGINES, Built by the
Hope Iron Works, Providence, R. I.
Warranted Superior to any other engine in the market, for economy of fuel, regularity of speed, and non-liability to derangement. [2 tf] JOS. P. MANTON, Agt.

ERICSSON CALORIC ENGINES OF GREATLY IMPROVED CONSTRUCTION.—Ten years of practical working by the thousands of these engines in use, have demonstrated beyond cavil their superiority where less than ten horse-power is required. Portable and Stationary Steam Engines, Grist and Saw Mills, Cotton Gins' Air Pumps, Shafting, Pulleys, Gearing Pumps, and General Jobbing. Orders promptly filled any kind of Machinery. JAMES A. ROBINSON,
1 tf—D 164 Duane street, cor. Hudson, New York.

TO IRON FOUNDERS.—By using the waste heat from a Cupola Furnace, connected with a Harrison Boiler, a saving of the entire cost of fuel for the blast can be guaranteed.
As thus applied, it may be seen daily in operation from 2 to 5 o'clock, p. m., at the Harrison Boiler works, Gray's Ferry Road, Philadelphia, Pa. J. B. HYDE, Agent.
1 tf 119 Broadway, New York.

TO MANUFACTURERS OF TEXTILE Fabrics.—Dutcher's Patent Temples, adapted to weaving all kinds of goods; also, Thompson's Patent Oil Cans for oiling Machinery—neat and economical; also Patent Shuttle Guides, which will protect the weaver and save the owner the cost of the guides every year. Furnished by E. D. & G. DRAPER.
1 6eow*] Hopedale, Mass.

LATHE CHUCKS—HORTON'S PATENT—from 4 to 36 inches. Also for car wheels. Manufacturer's address, E. HORTON & SON, Windsor Locks, Conn. 1 3*

WANTED—Ladies and Gentlemen everywhere, in a business that will pay $5 to $20 per day; no book, patent right, or medical humbug, but a standard article of merit, wanted by everybody, and sold at one third the usual price, with 200 per cent profit to our agents. Samples and circulars sent by mail for 25 cents.
3* tf] WHITNEY & SON, 6 Tremont st., Boston, Mass.

THE Excelsior Wind Mill and the Genuine Concord Axles manufactured by
1 15*] D. ARTHUR BROWN & CO., Fisherville, N.H.

CHARLES A. SEELY, CONSULTING and Analytical Chemist, No. 26 Pine street, New York. Assays and Analyses of all kinds. Advice, Instruction, Reports, etc., on the useful arts. 1 tf

SETS, VOLUMES AND NUMBERS. Entire sets, volumes and numbers of SCIENTIFIC AMERICAN (Old and New Series) can be supplied by addressing A. B. C., Box No. 773, care of MUNN & CO., New York.

© 1868 SCIENTIFIC AMERICAN, INC.

Advertisements.

A limited number of advertisements will be admitted in this page at the rate of $1 per line. Engravings may head advertisements at the same rate per line, by measurement, as the letter press.

FOURNEYRON TURBINE WATER Wheels manufactured as cheap as any other first-class wheel by J. CORNELL & CO., 1 3os Sandy Hill, N. Y.

IRON-WELL PATENT FOR SALE.— The Right retails at an average of over $150 per county. Will be sold cheap. Address 1 1os W. G. WRIGHT, Hornellsville, N. Y.

500 More Ag'ts Wanted to sell Richmond & Hoster's Silver-Plating Fluid sold by all Druggists. For Sample Bottle, inclose 10c., or circular, 3c. stamp. Address Richmond & Hoster, Seneca Falls, N. Y. 1 1os 2is

METTAM'S GALVANO ELECTRO METallic Insoles, Belts, and Armlets, for the cure of Rheumatism, Gout, Neuralgia, Cold Feet, and all diseases of the blood and nerves. Send for circular. LORIN BROOKS & SONS, Boot and Shoe dealers, 434 Broadway, New York, General Agents. 1 1os*

FOR SALE—The Right to Manufacture and sell "Parker's Patent Safety Attachment" for Pocket Books; can be applied to any Pocketbook, and is a perfect protection against Pickpockets. Samples sent on receipt of 25c. HOWES, NORRIS & CO., 1 1os Manufacturer's Agents, Springfield, Mass.

MILLSTONE-DRESSING DIAMONDS. Set in Patent Protector and Guide. Sold by JOHN DICKINSON, Patentee and Sole Manufacturer, and Importer of Diamonds for all mechanical purposes; also, Manufacturer of GLAZIERS' DIAMONDS, No. 64 Nassau street, New York city. Old diamonds reset. N. B.—Send postage stamp for descriptive circular of the Dresser. 1 12os

STIMPSON'S SCIENTIFIC WRITING

Materials:—Stimpson's Scientific Gold and Steel Pens and Ink-Retaining Penholders. Specimen Card of Steel Pens, 12 in number, and Holder, mailed on receipt of 50 cents. 1os 11s A. S. BARNES & CO., 111 William st., Ne York.

2 NEW BOOKS For Carpenters and Builders, and all who contemplate building. MODERN AMERICAN ARCHITECTURE, Containing Elevations and plans of Dwellinghouses, Schoolhouses, Churches, etc. THE PRACTICAL STAIR BUILDER, Containing 30 original plates, giving a complete treatise on the Art of Building Stair and Hand Rails. Price for each $10. Sent free by mail or express on receipt of price.
A. J. BICKNELL, Publisher, 282 River st., Troy, N. Y. Illustrated catalogue sent on receipt of stamp. 1 1os 1stf

EDITORS should read The Phrenological Journal and learn how to make perfect newspapers.

TAYLOR'S GROOVING MACHINES— Groove with and across the grain, ¼ to 1¼ inch wide. Sold only by S. C. HILLS, 12 Platt st., N. Y. 1 6*

RAILROAD, STEAMSHIP, MANUFACturers, and Engineer's Supplies, of all kinds, at 1 24 M. T. DAVIDSON & CO.'S, 84 John st., N. Y.

WANTED—One or two sets good second hand Woolen Machinery. Those having such for sale will address WM. MOORE, Kokomo, Ind. 1 3*

WANTED — Sunflower, Pumpkin, and Broomcorn Seed, in large lots. State price and quantity on hand. To be delivered in the city. Lowest cash price. Address WALTON, 1 70 and 72 Reade st., New York.

SCHOOL TEACHERS should read The Phrenological Journal, and learn to classify their students. Also to govern them wisely, $3 a year.

LE COUNT'S Patent Hollow Lathe Dogs,
8 Sizes, from ⅜ to 2 inches.....$ 8 00
12 Sizes, from ⅜ to 4 inches.....$17 30
Improved Machinists' Clamps, 5 sizes.....$11 60
Stout Boiler-makers' Clamps.....$ 4 00
All with Steel Screws, well fitted. Send for circular 1tf C. W. LE COUNT South Norwalk, Ct.

THE BEST BOLT CUTTER IS MERRIMAN'S PATENT—Which cuts a full, smooth thread at once passing over the bolt. The dies revolve, are instantly adjustable to the slightest variation, and open to release the bolt. Foreign Patents for sale. Send for circulars. H. B. BROWN & CO., 1 2 New Haven, Conn.

YOUR WIFE will thank you for The Phrenological Journal, with its suggestions for training children. Only $3 a year by post. Address S. R. WELLS, New York.

YOUR DAUGHTER would thank you for The Phrenological Journal, with its instructions on health and beauty. Only $3 a year.

PORTABLE STEAM ENGINES, COMbining the maximum of efficiency, durability, and economy with the minimum of weight and price. They are widely and favorably known, more than 600 being in use. All warranted satisfactory or no sale. Descriptive circulars sent on application. Address J. C. HOADLEY & CO., Lawrence, Mass. 1 tf

WOODWORTH PLANING MAchines, Molding, Mortising, Tenoning, and Sash Machines, Scroll Saws, Re-Slitting Mills, Circular-Saw Mills, Spoke Lathes, Daniels's, and Gray & Wood Planers, Shafting Pulleys, etc., at reduced prices, Address CHAS. H. SMITH, 1 4* 135 North 3d st., Philadelphia, Pa.

BROWN'S PATENT LOW-WATER REporters, a certain preventive from the explosion of Steam Boilers by reason of low water. Warranted the most reliable and most simple low-water indicator ever offered. Sole Agents for New York State, M. T. DAVIDSON & CO., 1 11] 84 John st., New York.

BARREL MACHINERY. — Greenwood's Patent Stave and Heading Machinery, for Tight and Slack Work. Geddis's Patent Barrel Heaters. G. L. Benton's Patent Convex Emery Wheels, for Gumming and Sharpening Saws. JOHN GREENWOOD, Rochester Barrel Machine Works Rochester, N. Y. 1 11*tf

SCHLENKER'S PATENT BOLT CUTting Machine.—The Best in Market.—Two Sizes, cutting bolts from ⅜ to 3 inches. Up to 2¼ inches, one passing over the iron is sufficient for cutting a perfect thread, either V, square, or wood screw. Heads to fit the ordinary lathe or other bolt cutting machines, furnished to order. Also, nut taps furnished to order. Send for circular. Address R. L. HOWARD, Buffalo, N. Y. 1 6*

STEAM and GAS FITTERS, Also, Plumber's Goods, and Tools of all kinds. Quinn's Patent Boiler Ferrule, the only Sure Remedy for a leaky Tube. Also, Steam Gages, Gage Cocks, Water Gages, safety Valves and Feed Pumps, for sale by JOHN F. C. RIDER, 47 Dey st. N. Y. Manufactory at South Newmarket, N. H 25-17

REPEATING Vest Pocket Light, in elegant Silvered Cases. Send for circular. Address 1 2*os] L. F. STANDISH, Springfield, Mass.

BEFORE BUYING TURBINE WATER WHEELS—Send for Circulars of PEEKSKILL MANUFACTURING CO., 1 5os*] Peekskill, N. Y.

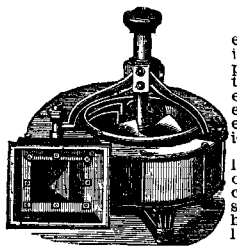
13 Portable Engines, from 6 to 15 Horse.
One Corliss Engine, 20-in cylinder, 4 foot stroke.
One " " 18 " 3½ " "
One " " 10 " 3 " "
All in good order, at a low price, for cash. Address CHAS. H. SMITH, 1 1os*] 135 North 3d st, Philadelphia, Pa.

WHEATON'S OINTMENT cures the Itch WHEATON'S OINTMENT will cure Salt Rheum. WHEATON'S OINTMENT cures Old Sores. WHEATON'S OINTMENT cures all diseases of the Skin. Price 50 cents;—by mail 60 cents. All Druggists sell it. WEEKS & POTTER, Boston, Proprietors. [1 1*os tf-N

GREAT ECONOMY IN
WATER POWER.

LEFFEL'S DOUBLE TURBINE WATER WHEEL.—Best Wheel in Existence.—Manufactured by JAS. LEFFEL & CO., at Springfield, Ohio, and New Haven, Conn. New Illustrated Pamphlet sent free on application. 1os*

TURBINE WATER WHEELS.



The REYNOLDS PATENT embodies the progressive spirit of the age. Simplicity, Economy, Durability, Accessibility all combined. The only Turbine that excels Overshots. Awarded the Gold Medal by American Institute.
Shafting, Gearing and Pulleys furnished for all kinds of Mills, made on Mechanical Principles, under my personal supervision, having had long experience. Circulars sent free.
GEORGE TALLCOT, 1 4*tf] No. 96 LIBERTY STREET, NEW YORK.

STOCKS, DIES, AND SCREW PLATES, Horton's and other Chucks. JOHN ASHCROFT, 50 John st., New York. 1 7*

WIRE ROPE.

Manufactured by
JOHN A. ROEBLING
Trenton, N. J.
FOR Inclined Planes, Standing Ship Rigging, Bridges, Ferries, Stays or Guys on Derricks and Cranes, Tiller Ropes, Sash Cords of Copper and Iron, Lightning Conductors of Copper. Special attention given to hoisting rope of all kinds for Mines and Elevators. Apply for circular, giving price and other information. 1 9*tf

BOILER FELTING SAVES TWENTYfive per cent of Fuel. JOHN ASHCROFT, 1 7*] 50 John st., New York.

STEAM AND WATER GAGES, STEAM Whistles, Gage Cocks, and Engineer's Supplies. 1 7*] JOHN ASHCROFT, 50 John st., New York.

B. T. TRIMMER'S Smut Machines and Separators, manufactured at the Rochester Agricultural Works, Rochester, N. Y. 1 8*

WROUGHT-Iron Pipe for Steam Gas and Water; Brass Globe Valves and Stop Cocks, Iron Fittings, etc. JOHN ASHCROFT, 50 John st., N. Y. 1 7*

D. BALLAUF, MODEL MAKER, No. 414 Seventh street, Washington, D. C. Orders for Certified Duplicates of Patent Office Models and Original Models for Inventors. 1 3*

$200 A MONTH IS BEING MADE with our IMPROVED STENCIL DIES, by Ladies and Gentlemen. Send for our free Catalogue containing Samples and Prices. Address 1 tf—R.] S. M. SPENCER & CO., Brattleboro, Vt.

WANTED, an Agent—One chance in each town, worthy the attention of an active business man, to take the agency for the sale of Bradstreet's Rubber Molding and Weather Strips, applied to the sides, bottom, top, and center of doors and windows. The sale is beyond anything ever offered before to an agent, and from $10 to $25 per day can be made. Send for agent's circular. The first who apply secure a bargain. Terms for Molding, cash. J. R. BRADSTREET & CO., Boston, Mass. 1 3*

TURBINE WATER WHEELS.— Luther's Direct and Reacting Turbine Wheels manufactured and for sale by the NOVELTY IRON WORKS Foot of East 12th st., N. Y. Send for Circular. 1 12*

THE
HARRISON BOILER

Is the only one now offered for sale entirely FREE from
DESTRUCTIVE EXPLOSION.
Twenty thousand horse-power have been made and put in operation within the last three years, with a constantly increasing demand. For descriptive circulars and price apply to the Harrison Boiler Works, Philadelphia, Pa., or to J. B. HYDE, Agent, 1 tf] Offices 9 and 10, No. 119 Broadway, N. Y.

ASHCROFT'S LOW WATER DETECTor will insure your Boiler against explosion. JOHN ASHCROFT, 50 John st., New York. 1 7*

SHEET AND ROLL BRASS, BRASS AND COPPER WIRE, GERMAN SILVER, ETC., Manufactured by the THOMAS MANUFACTURING CO., Thomaston, Conn.
Special attention to particular sizes and widths for Type Founders, Machinists, etc. 1 2*

SAWS! SAWS!! SAWS!!!

Attention, Lumbermen!

HENRY DISSTON, OF PHILADELPHIA,

IS MAKING BOTH INSERTED AND SOLID-TEETH SAWS THAT ARE PREFERRED, BY THOSE WHO USE THEM, ABOVE ALL OTHERS.
☞ For Particulars send to Factory, 67 and 69 Laurel street, Philadelphia, Pa. [25 13os

IMPORTANT.
A MOST VALUABLE MACHINE for all kinds of irregular and straight work in wood, called the Variety Molding and Planing Machine, indispensable to competition in all branches of wood-working. Our improved guards make it safe to operate. Combination collars for cutters, saving 100 per cent, and feed table and connection, for waved moldings and planing, place it above all others. Evidence of the superiority of these machines is the large numbers we sell, in the different states, and parties laying aside others and purchasing ours, for cutting and shaping irregular forms, sash work, etc.
We hear there are manufacturers infringing on some one or more of our nine patents in this machine. We caution the public from purchasing such.
All communications must be addressed "Combination Molding and Planing Machine Company, Post-office Box 3280, New York. All our machines are tested before delivery, and warranted.
Send for descriptive pamphlet. Agents solicited. 2 tf

CLERGYMEN would find much matter in The Phrenological Journal to be found nowhere else.

FOR THE BEST FRICTION CLUTCH PULLEY, apply to HUTCHINSON & LAURENCE, 8 Dey street, New York. 1 3

SMALL STEAM ENGINES, From 2 1-2 to 8 Horse-Power, manufactured and in store. For sale by JOHN F. C. RIDER, South Newmarket, N. H., or 47 Dey st., New York. 1 16

PECK'S PATENT DROP PRESS,— All Sizes, on hand or made to order at short notice, by the patentees and sole manufacturers MILO PECK & CO., 1 3 294 Elm st., New Haven, Conn.

CIRCULAR SAWS,

WITH
EMERSON'S PATENT MOVABLE TEETH.

These Saws are meeting with
UNPRECEDENTED SUCCESS,
And their
GREAT SUPERIORITY OVER EVERY OTHER KIND,
Both as to
EFFICIENCY AND ECONOMY
Is now fully established.

Also,
EMERSON'S PATENT PERFORATED
CROSS CUTTING, CIRCULAR, AND LONG SAWS.
(All Gumming Avoided.) And
EMERSON'S PATENT ADJUSTABLE SWAGE,
For Spreading, Sharpening, and Shaping the Teeth of all Splitting Saws. Price $5.
Manufactured by the
AMERICAN SAW COMPANY,
Office No. 2 Jacob street, near Ferry street, New York.
☞ Send for New Descriptive Pamphlet and Price List. 1 tf

WOODWORTH PLANERS A SPECIALTY—From new patterns of the most approved style and workmanship. Wood-working Machinery generally. Nos. 24 and 26 Central, corner Union street, Worcester, Mass. 1*tf] WITHERBY, RUGG & RICHARDSON.

PATENT SHINGLE, STAVE, AND Barrel Machinery, Comprising Shingle Mills, Heading Mills, Stave Cutters, Stave Jointers, Shingle and Heading Jointers, Heading Rounders and Planers, Equalizing and Cut-off Saws. Send for Illustrated List. FULLER & FORD, 1 4*tf] 282 and 284 Madison street, Chicago, Ill

FOR ENGINE BUILDERS' AND STEAM Fitters' Brass Work, address F. LUNKENHEIMER, 1 10*] Cincinnati Brass Works.

WHEELER & WILSON, 625 BROADway, N. Y.—Lock-stitch Sewing Machine and Buttonhole do. 1tf

R. BALL & CO., SCHOOL STREET, WORCESTER, MASS., Manufacturers of Woodworth's, Daniell's, and Gray & Wood's Planers, Sash Molding, Tenoning, Mortising, Upright and Vertical Shaping, Boring Machines, Scroll Saws and a variety of other Machines and articles for working wood.
Send for our Illustrated Catalogue. 1

MECHANICS should read The Phrenological Journal, and learn how to select boys to learn trades.

CAUTION.— We are the Sole Agents, in New York and its vicinity, for the Silver Lake Manufacturing Co.'s Patent Lubricating Packing for Steam Engines, Pumps, etc. All parties are cautioned against the use or sale of any packing made from dry soap stone or other powdered substances used in any fibrous material. M. T. DAVIDSON & CO. 1 11] 84 John st., New York.

ENGINE LATHES, IRON PLANERS, Upright Drills, Bolt Cutters, Compound Planers, Slotters, Shapers, Gear-Cutting Engines, Universal Chucks Twist Drills, Ratchet Drills, etc., at reduced prices. Address CHAS. H. SMITH, 1 10*] 135 North 3d st., Philadelphia, Pa.

Sault's Patent

FRICTIONLESS Locomotive Valves, easily applied; requires no changes. 24 tf] M. & T. SAULT, New Haven, Conn.

NITRO-GLYCERIN.— UNITED STATES BLASTING OIL CO.—We are now prepared to fill all orders for Nitro-Glycerin, and respectfully invite the attention of Contractors, Miners and Quarrymen to the immense economy in the use of the same. Address orders to JAMES DEVEAU, Sec., 1 3*] 52 Pine street, New York

LAWYERS should read The Phrenological Journal, that they may read clients and culprits.

ANDREWS'S PATENT PUMPS, ENGINES, etc.—
CENTRIFUGAL PUMPS, from 90 Gals. to 40,000 Gals per minute, capacity.
OSCILLATING ENGINES (Double and Single), from 2 to 250 horse-power.
TUBULAR BOILERS, from 2 to 50 horse-power, consume all smoke.
STEAM HOISTERS to raise from ¼ to 6 tuns.
PORTABLE ENGINES, 2 to 20 horse-power.
These machines are all first-class, and are unsurpassed for compactness, simplicity, durability, and economy of working. For descriptive pamphlets and price list address the manufacturers, W. D. ANDREWS & BRO., 1 tf 414 Water street N. Y

FOR FIRST-CLASS SHAFTING WITH Patent Self-oiling Boxes and adjustable Hangers, also Mill Work and special machinery, address 1 tf BULLARD & PARSONS, Hartford, Conn.

PRESSURE BLOWERS—Equal in Force to Piston Blowers, and a perfect substitute for both Fan and Pistons—running more easily than either. Adapted for Blast, and Cupola, and Heating Purposes, Forges Steamships, Boilers, Ventilation, etc., etc. Prices according to sizes, ranging from $25 to $1,500. Address, for Circular B. F. STURTEVANT, 1 tf 72 Sudbury street, Boston, Mass.

THE CELEBRATED "SCHENCK" WOODWORTH PLANERS WITH NEW AND IMPORTANT IMPROVEMENTS, Manufactured by the SCHENCK MACHINE CO., MATTEAWAN, N. Y. JOHN B. SCHENCK, President. T. J. B SCHENCK, Treas. 1 tf

IRON PLANERS, ENGINE LATHES, Drills, and other Machinists' Tools, of Superior Quality, on hand and finishing. For Sale Low. For Description and Price, address NEW HAVEN MANUFACTURING CO., New Haven, Ct. 1 1* tf

PHOENIX IRON WORKS— Established 1834.
GEO. S. LINCOLN & CO.,
Iron Founders and Manufacturers of Machinists' Tools 54 to 60 Arch street, Hartford, Conn.
We are prepared to furnish first-class Machinists' Tools on short notice. Samples may be seen in our Wareroom. Also, we keep constantly on hand our Patent FRICTION PULLEY, Counter Shafts for Lathes, etc. 24 tf

PORTABLE AND STATIONARY Steam Engines and Boilers, Circular Saw Mills, Mill Work Cotton Gins and Cotton Gin Materials, manufactured by the ALBERTSON & DOUGLASS MACHINE CO., New London, Conn. 1 tf

YOUR "Sweetheart," would thank you for The Phrenological Journal. In it she would find the means by which to judge character correctly.

STEEL CASTINGS.
HAVING INCREASED OUR FACILITIES, we are now prepared to do Job Steel Castings of all descriptions, to pattern. Address SCHENECTADY STEEL WORKS, 1 Schenectady, N. Y.

INVENTORS having Patents to sell will find it to their advantage to visit GEO. M. DANFORTH & CO.'S
Inventors' Exchange,
512 Broadway, New York, Opposite St. Nicholas Hotel.
Refer by Permission to John S. Appleton, of Appleton & Co., Publishers, 445 Broadway, N. Y.; Hon. Jonathan E. Field, Stockbridge, Mass.; Hon. Robt. McClelland, Detroit, Mich., formerly Sec. Int., Washington; Hon. A. B Olin, Judge Supreme Court, Washington, D. C. 1 3*

STEAM ENGINES and BOILERS, Steam Pumps, Engine Lathes, Planers, Shaping Machines, Brass Finisher's Tools, and Machinists' Tools of all kinds. Also, Grist Mills, Cotton Gins, Saw Mills, Wheel and Hub Machines, Shingle Machines, and Wood Working Machinery of all kinds at JOHN F. C. RIDER'S, 47 Dey st., New York. Manufactory at South Newmarket, N. H. 1 16

A MESSIEURS LES INVENTEURS— Avis important. Les inventeurs non familiers avec la langue Anglaise, et qui préféreraient nous communiquer leurs inventions en Français peuvent nous addresser dans leur langue natale. Envoyez nous un dessin et une description concise pour notre examen. Toutes communications serons reçus en confidence.
MUNN & CO.,
Scientific American Office, No. 37 Park Row, New York

© 1868 SCIENTIFIC AMERICAN, INC.